

THE ZOOLOGIST.

THIRD SERIES.

VOL. IX.]

DECEMBER, 1885.

[No. 108.]

THE RABBIT-PEST IN NEW ZEALAND.

BY ROBERT S. HAWKINS.

A GREAT deal of uncertainty has existed in the Wairarapa, Wellington Province, as to the possibility of keeping down Rabbits by Ferrets only. The uncertainty has largely been caused by writers who, professing a knowledge of the country in which Ferrets have been tried, assert that the result has been unsatisfactory. The question is one of such vast importance, no less to myself than to the whole of the settlers in the Wairarapa, that I resolved to go over to Marlborough and ascertain the facts by personal inquiry and sight. I propose to state as concisely as possible the result of my visit.*

It is well known that Messrs. F. and F. G. Bullen took the lead in the introduction of Ferrets into the Kaikoura, Marlborough Province, and that it is the fact of their success that is so persistently denied. I went at the end of May last to their house, and during a stay of ten days received the most cordial hospitality. Messrs. Bullen's house is on the sea-coast, about five miles from Kaikoura. There are about 2000 acres occupied with the house and homestead lying between the rivers Kohai

* The colony of New Zealand was previous to 1876 divided into nine Provinces, and in that year the county system was adopted, the former division being retained as "Provincial Districts." The writer resides in the southernmost Provincial District (Wellington) of the North Island, and the journey which he describes was made to the northernmost Provincial District of the South Island.



and Kuhautara, of which 500 acres are flat land under cultivation, or laid down in pasture, and the rest is chiefly round hills, some of which have been ploughed and others are being ploughed. This land has been for the most part fenced with Rabbit-netting. Poison has been and is used, and, though there are Ferrets on it, they are as far as possible caught and taken on to the run. Mr. F. Bullen occasionally shoots over this land, and takes care that Rabbits do not establish themselves there. Besides this Messrs. Bullen have 300 acres of fine limestone hill on the Point, and running down to the Quay at Kaikoura. This was acquired over two years ago, and was then swarming with Rabbits. It was fenced with wire-netting and thoroughly poisoned. Messrs. Bullen ploughed it, and it was, when I saw it, covered with fine crops of swedes and turnips. Nowhere could I see any sign of a Rabbit.

I have dealt with these two farms in order to avoid any confusion. I now come to the main run, which contains 90,000 acres, and lies between the rivers Kahautara on the north, Conway on the south, and is bounded on the east and south-east partly by the sea and partly by other properties. The run consists of land of various formations and qualities, from rock and clay to shingle-beds and limestone, though the last is of comparatively small extent. The upper hills for the most part are covered with tussock, but the sides and gullies have considerable areas of fern, small bush, and scrub. The homestead and country known as the Green Hills, which forms part of the run, is at an altitude of 1600 feet above the sea, and in part lies close under ranges, which, when I was there, were covered with snow. Some 9000 acres are flat and low downs, ploughable, and of this about 4000 acres have been ploughed, and were partly in grass and partly in root-crops. Beyond this 9000 acres the run is of such a character that all mustering must be done on foot. The Rabbits (which are the silver-grey) began to show themselves in serious numbers in 1870, and continued to increase rapidly in the following years. In 1872 Messrs. Bullen turned out a dozen Ferrets, and from that time continued to turn out Ferrets in small numbers, as they could get them, up to 1878, when they began breeding Ferrets; and since then they have turned out from 100 to 200 Ferrets yearly. In 1875, 1876, and 1877, Messrs. Bullen had from ten to twelve rabbiters in

constant employ. At the end of the year 1877, finding that the Rabbits were still increasing, and having reason to believe that the Ferrets were being destroyed, they dismissed all rabbiters; but in March, April, and May, 1878, they employed again two men on a part where the Rabbits were especially thick, and the result being unsatisfactory they dismissed them. From that date they have not employed rabbiters. The only men employed in connection with Rabbits are two. These were necessary for the protection of the Ferrets. (This was prior to the Act making it penal to take or destroy Ferrets.) One is, with his son, a boundary keeper on the Conway, and it is his duty to kill Pigs and any Rabbits he may see. The other is in the position of a small settler, who occupies a homestead of Messrs. Bullens' at the Kahautara, milks from twenty-four to forty cows, and employs two labourers. He breeds Ferrets for Messrs. Bullen on a capitation fee, and kills Pigs and Rabbits. His chief duty as to Rabbits is to keep a bit of river boundary, and shoot Rabbits as they come on from the adjoining property. These two men are at opposite sides of the run, thirty miles apart. They only have two or three dogs, each carefully trained to Ferrets. The rabbit-skins tallied over by the man at the Kahautara boundary were in June, 1883 (representing five months' killing), 93 dozen; in August, 1883, 48 dozen; in May, 1884, 109 dozen, giving a total of 3000 skins in sixteen months, nearly all the Rabbits coming over the boundary.

Messrs. Bullen have never laid any poison at all on the run. It is manifest that the two men employed, if they were doing nothing but rabbiting, could have no perceptible effect in reducing Rabbits on 90,000 acres of such country as I have described, and that no poison at all having been used, if, as I think I shall show, the Rabbits have been completely overcome, it is the Ferrets alone that have done the work. Before stating what I saw, I will give the sheep figures.

In 1878 Messrs. Bullen shore 51,578 sheep, but, being satisfied that the flock had suffered serious injury, and were deteriorating from Rabbits, they then reduced it by boiling down. In 1879 they shore 42,600 sheep, and again reduced the flock by boiling down. In 1880 they shore only 34,300. From this date the impression made by the Ferrets became sensible, and they began to increase the flock, as shown by the following shearing tallies:—

1881, 39,000; 1882, 42,000; 1883, 47,000; and the flock now stands at about 50,000, all the sheep I saw being in excellent condition.

I have visited different parts of the run, and I have been in the evening up gullies, along creeks, and by spurs, at which I was informed that at one time fifty to sixty Rabbits could be shot in one afternoon and evening with a single gun, and have never seen more than two Rabbits in a ride, and but very few signs of Rabbits. I travelled to Swyncombe, now Mr. Wood's property, past the Clarence Shearing Reserve (now occupied by Mr. Gibson, with the Clarence County) to the Green Hills, and saw comparatively few Rabbits, absolutely none on Messrs. Bullens' land. I rode over the Quail Range down the Charwell Creek, returning to the homestead after sundown, a ride of fifteen miles. I only saw two Rabbits and very rare signs of Rabbits; and this country, the manager (Mr. McPhadson) informed me, was a few years back completely infested with Rabbits.

I rode from the Green Hills by the Shearing Reserve, and, leaving Swyncombe on the left, followed the creek down to the homestead. The day was warm and sunny after rain, yet I only saw five Rabbits during the whole ride, about seventeen miles, and the chief indications were not on Messrs Bullens' side. The whole of this country a few years back swarmed with Rabbits.

Besides Ferrets, Messrs. Bullen, in 1878, turned out two Weasels, but nothing has since been seen of any Weasel, and it is uncertain if the pair turned out were not two males. They have also recently let out six Mongoose, one of which was seen on the run, and another trapped on a neighbouring farm, both in good condition.

At present, the Ferret-keeper informed me, they have no place on which it is necessary to turn out Ferrets, and they are only being bred in case of accidents; and he expressed the opinion that all the Rabbits on the run were wanted for the Ferrets, and further stated that wild pigs are killed and left on the run for the Ferrets to eat. The Ferrets have been almost as great enemies to the Rats as to the Rabbits. In 1880, during hot close weather, distemper took off a large number of Ferrets, and the Rabbits increased slightly in some parts.

Mr. Wood, who has had Swyncombe—35,000 acres—about two years, has poisoned largely in parts, and is now breeding

and turning out Ferrets. He has no rabbiters. He is entirely confident as to the result. There is no doubt that a large sprinkling of Ferrets spread into Swyncombe from Messrs. Bullens' run. Mr. Gibson, who, as I have said, has the Clarence Run and Shearing Reserve (over 100,000 acres), is pursuing the same course. He has no rabbiters, and is breeding Ferrets largely. He last year turned out as many as 380 Ferrets. He considers that the Ferrets have practically cleared the Rabbits off a tract of country fourteen miles by twelve. Below Messrs. Bullen, in the Amuri, a few Ferrets have been turned out as a precaution, but the measures taken by the Messrs. Bullen and the run-holders above practically stopped the spread of Rabbits on that side.

After leaving Messrs. Bullen, I rode a two days' journey from Kaikoura to Blenheim—ninety-five miles—and had an opportunity of seeing Mr. Stace, who is in charge of the Starborough Run. Except in patches, there were comparatively few Rabbits to be seen south of the Clarence River on the other side of the "Lookers on." The first real Rabbit-eaten country was reached on the further side of Flaxborne, but the poisoning had been going on, and but few Rabbits were to be seen. Starborough was in the same state. The hills and downs showed one large Rabbit-camp, and quantities of dead Rabbits. About a dozen rabbiters were employed on Starborough up to last year, when the number was reduced; but there are still some rabbiters employed. Last year about 400 Ferrets were turned out, but the distemper was fatal to considerable numbers. Mr. Stace tallied, in 1882, 163,000 rabbit-skins, and in 1883, 311,000 rabbit-skins. The black and grey Rabbit takes the place of the silver-grey north of the Clarence. He fears that the land is not adapted to Ferrets; it has a strong clay subsoil, has no bush or scrub whatever, but is entirely tussock, and has over a large portion little or no water in summer. The whole run contains over 35,000 acres, of which, perhaps, from 10,000 to 13,000 acres would be ploughable.

While fully admitting the disadvantages to Ferrets of the absence of all shelter, other than the tussock-grass and water-holes, and Rabbit-burrows, and the still greater disadvantage of want of water, I think, from several things mentioned to me by Mr. Stace, he is premature in concluding that Ferrets will not give the results on his country which they have below. Whether

this be so or not, we have no country like Starborough in the Wairarapa; none that I have seen that will not hold Ferrets as well as, or even better than, the Kaikoura country.

When nearing Blenheim I was surprised to find on one run a considerable number of Rabbits. I was informed that they were not poisoning there because the Rabbits were sent into Rabbit preserving works. We are fortunate, I think, in not having any Rabbit preserving works in the Wairarapa.

I think it needless to express any opinion on the above statement of what I have heard and seen. I would only say that common action is necessary. It is no use one man turning out Ferrets if they are to be systematically killed on the adjoining run or farms.

No doubt if the Ferret is, with one consent, adopted by all the pastoral settlers in the Wairarapa, a substantial number of persons will be at once thrown out of the employment they are now engaged in. I cannot but feel that these men have greatly helped the community to the best of their ability when no better means of keeping Rabbits under was at our disposal, and I hope that the greater part will soon enter on some other employment. But at the same time I must point out how vast the gain will be to the whole population in setting free the very large sums of money which have been yearly paid away in entirely unprofitable labour, and in turning very large quantities of wheat and oats to utterly unproductive purposes. The same money employed in felling bush and scrub, in ploughing and fencing, would have given a large return, adding to the aggregate wealth of the Wairarapa, increasing the demand for productive labour, and benefitting the whole community. Nor is it merely the money wasted in its application to unproductive purposes; the damage done to flocks and the depreciation of property has told and is telling heavily against the general prosperity of the district.

It is the common interest of all that this solution of the Rabbit difficulty should be brought about.

One word to the settler on small plots. If a Ferret visits your poultry-yard do not kill it. Get a mate and make it pay for the damage. A pair of full-grown Ferrets, if well cared for—and one of the boys could easily do it—will bring you in from £5 to £8 a year, not a bad beginning for a savings' bank account for a boy at school; and he may easily make it £15 or £20.

BIRDS USED FOR SPORT IN CHINA.

At a meeting of the Société Nationale d'Acclimatation held some little time ago in Paris, Monsieur P. A. Pichot exhibited a curious collection of drawings sent from Pekin by M. Collin de Plancy, one of the interpreters of the French legation. These drawings, made on thin paper by Chinese artists, were designed to illustrate the various methods of taming and training birds in China, concerning which M. Pichot gave the following interesting account, which we translate from the 'Bulletin de la Société':—*

"The birds used for sport in China, as represented in this series, may be divided into two classes, the first comprising those used for what may be termed violent sport, like game cocks and hawks. Unfortunately they are not all represented in this series. We miss the great Eagle with white eyebrows, which in certain provinces of China has long been trained, as Falcons are in Europe, but for catching wolves, foxes, deer, and roebucks. Sheng-Ching-t'ung Chih relates that in Mantchouria, towards the middle of the eighteenth century, the Emperor Kienlung used to fly at Roebuck with the Hai-tung Ching, that is with the Eagle with white eyebrows, of which Père du Halde, in his description of China, says:—'One of the finest birds is that called Haitsing, which is only taken in the district of Han-tchong-fu, in the province of Chensi, and in certain cantons of Tartary. It may be compared with our finest falcons, although of course much larger and stronger. It may be called the king of birds of prey in Tartary and China, for it is the handsomest, the keenest, and the most courageous. It is, moreover, so highly prized that as soon as a specimen is captured it is obliged to be taken to the Court, where it is presented to the Emperor, and then handed over to his falconers.'

"M. Tony Conte has lately given an account of the travels of MM. Benoist-Méchin and de Mailly in Turkestan. They brought back with them one of these Eagles. To the best of my belief it is the same species as that found in Mantchouria, *Haliaëtus albicilla*. This bird is now in the hands of one of my friends and competitors in falconry, M. Paul Gervais. He has trained it, or continued its training, for the bird was brought to Europe in charge of a native falconer, and had already distinguished

* Bull. Soc. Nat. d'Acclim. 4 Ser. tome i. pp. 627—635.

itself by numerous exploits. In the plains of la Brie there are now no wolves to hunt; the Eagle of Meaux has to be satisfied with humbler quarry; only a few cats from time to time fall into its clutches. I do not know that the householders of the neighbourhood care much for this kind of Tartarian sport, but at any rate M. Gervais' Eagle is very clever at it, and it is a pity there is no nobler quarry to offer it. It is rather a heavy bird to carry out hawking, for it measures from 70 to 80 centimetres in height. Like all birds of prey, it only kills when it is hungry, and as it can fast for several days without seeming to feel it, it is not always easy to get it into condition and to keep it in wind.

"The true Falcons seem to be less used in China than they have been heretofore in our country. Thus I have not yet been able to obtain any precise information on the use of the Peregrine Falcon in China. I have found it difficult to recognise, in any of the ancient or modern drawings which have been sent to me from time to time, the true *Falco peregrinus*. On the other hand, the Goshawk, *Astur palumbarius*, and other short-winged species, are easily recognisable. These are powerful birds that can take Cranes and Hares, and even larger game. But it is the little Sparrowhawk, especially, which seems to be generally employed, and which is represented in various ways in M. Colin de Plancy's collection of drawings. It is used for flying at Quail and Snipe; this latter flight appears to us European falconers a very difficult one, unless, as is possible, the Snipe of that country is slower and heavier on the wing than ours. I do not think there exists in the annals of European falconry any account of hawks being flown regularly at Snipe. In China, on the contrary, it is often done. The training of Chinese falcons, however, appears not to be carried so far as with us; for, generally speaking, instead of allowing their birds complete liberty when flying them, they keep them fastened to a reel of twine rolled up close in their sleeve. When they cast off their hawks at Snipe or Quail, the moment the latter rise, after allowing a tolerably near approach, the reel unwinds with wonderful rapidity, and the hawk 'binding,' being himself 'bound,' cannot carry the quarry, and escape from the owner, who approaches to take it up.

"So much for the birds composing the first group in the collection of M. Colin de Plancy, and this group I have called *Oiseaux de guerre ou de combat*. The second comprises birds for

sport, which are gentle and docile, and this group I call *Oiseaux de paix*.

"Everything in China is, more than anywhere else, a matter of fashion and season. At certain periods of the year you will see the air full of stag-beetles. When the season of stag-beetles is over there comes in a sort of game which is something like what we call '*le diable*,' in vogue in France at the commencement of the present century. It is a top with an opening, which is held balanced with twine, and then thrown up to a great height when it has been set going, and which you try to catch in different ways. When the season for '*le diable*' comes round in China everyone provides himself with one of these toys—everyone plays at it in the streets and in the houses.

"Another game of the season is the promenade of the birds. This of all others seems to me extremely curious. At this time of year everyone walks with some feathered pet on his hand, not perched on the finger nor on the shoulder, but on a little crutch, the top of which is wrapped round with linen or cotton, so that the bird may not hurt his feet. It has a little leash passed round its neck: but it is so tame that it does not try to fly away, and remains on the little crutch as if stuffed. The Chinese then carry these little crutches from place to place through the streets, holding them gravely as one holds a taper; they stop in the streets and in the crossings to greet each other and exhibit their captives, and seem as delighted with their little crutches as we do to put flowers in our button-holes in spring.

"There are three birds especially which are used for these promenades: the Red-tailed Shrike, *Lanius luzionensis*, of which the Chinese name, *U-po-la*, means tiger-bird or thrush-tiger, doubtless on account of its fierce character and cruel habits. They sometimes train these Shrikes to fly at little birds, and the Chinese consider them more difficult to train than Falcons. Dr. Mollendorf has seen Sparrows taken with *Lanius bucephalus*; but it is especially for promenading with them on little perches that they are tamed.

"Another species much used in this way is the Chinese Blue Magpie with red feet, *Urocissa sinensis*, which, like all Magpies in China, are supposed to bring good luck. Thus they are called by the Chinese *Hsi-ch'ueh*, auspicious birds, and *Pên-ti'ao* says, 'They foretell happiness, so they call them birds of joy.'

“Finally, a third species, also much used in the promenades, is a sort of Titmouse, *Suthora Webbiana*, Gray, which the Chinese call *Hsiang-sse-niao*, meaning ‘love-bird,’ because they keep close to each other on their perches and seem exceedingly affectionate.

“It is thus that, indirectly and by transparent allusions, the Chinese promenaders exchange over the wings of their captives their pledges of affection, and their wishes for prosperity. Is not this more delicate and more refined than the simple touch of the hat with which we in passing greet each other?

“But a fresh season brings fresh amusement, namely, the game of Grosbeaks, of which three species are recognised, one exactly resembling our own, but more particularly remarkable from its large wax-coloured beak, from whence its Chinese name of *La-tsui* is derived; this is the Grosbeak of Japan and of Mantchouria, *Eophona personata*, Schlegel. These birds are wonderfully docile, and when the promenades of birds have ceased, the Chinese fix little perches on the fronts of their dwellings, to which the Grosbeaks are fastened. There are householders who have ten, twenty, up to thirty Grosbeaks fastened by the neck. They touch and handle them without their manifesting any signs of fear. The sport for which they are used is this:—The owner undoes the fastening which goes round the neck of his bird; he then goes to a distance and shows it a grain of millet-seed which he puts in his mouth. Then he has a little ball of clay, which he throws up in the air to a great height. The Grosbeak springs from his perch, flies up and catches the little ball at the instant when, having ceased to ascend, it is about to fall to the ground; then he returns and perches on the shoulder of his master, who rewards him by giving him the grain of millet-seed. Some of these birds are so clever at this kind of exercise that, not satisfied with fetching a single ball, they will even catch a second one thrown up at the same time as the first. But as the ball is a hard substance, either clay or ivory, and the bird’s beak is not elastic, they resort to a trick which enables them to carry two balls at the same time. The first ball thrown up must be smaller than the second, so that the first goes well into the mouth, while the largest one is held between the mandibles; otherwise the bird, opening his beak to seize the second, would be obliged, like the crow in the fable, to let fall

the first. Such is, at quite a different season, the popular amusement in certain provinces or towns of the Celestial Empire.

“If from these tricksters in the highways we turn to operative artists, I have a few words to say about the Mantchourian Lark. It is much larger than that which we have here. It sings marvellously, with great flexibility and compass, and not only its own particular song; for it is easy to teach it the songs of many other birds, and even the cries of many animals. Mme. Gray, the wife of a Protestant missionary at Canton, in a work which she has written on her sojourn in that country, states that she once saw at Gambon a Lark which imitated the barking of a dog and the mewling of a cat, as a Starling would do in this country. In spring the Chinese may be seen bringing out their cages with Larks, and carrying them about the streets. They establish singing competitions, and appoint jurors to award the prize. At the time of certain religious festivals they bring these cages into the temples and hang them to the joists of the ceiling, so that the singing of their birds may do honour to the divinities they venerate.

“The album of illustrations of which I have spoken will better exemplify the charming and simple nature of the pastimes to which I have alluded.”

At the invitation of the President, a discussion then ensued as follows:—

M. Decroix: May I ask Mgr. Perny, who is present, whether these pastimes are generally practised throughout the country, or whether they are only exceptional, and, for instance, confined to the South, North, East, or West?

Mgr. Perny: That which M. Pichot has described takes place more particularly in certain provinces of China. The customs are nearly the same everywhere, but with variation. In the provinces of Szu-tchouan and of Kouang-tchéou they are less common.

M. Pichot: The information which I have received comes chiefly from Shanghai and Peking.

Mgr. Perny: There is another very interesting bird in China—the Cormorant—of which M. Pichot has not said anything, and which the Chinese use especially for fishing. They train these birds very well. A fisherman has a dozen or so in his

boat, and when he comes to a place where there are fish, he sends them in. They disappear under water, and in about five minutes reappear, bringing the fish to the feet of their owner. It is most interesting to see two or three of them join together in bringing back an unusually large fish. This sort of fishing is very profitable and very amusing.

M. le President: Would the Chinese Cormorant be easy to introduce into this country?

M. Pichot: The Cormorant is a bird of our own country. The Chinese species, although smaller, differs very little from ours. They are called *Lu-tze* in China, or *Shui-lao-ya*, which means 'Sea-crow.' I may add on this subject, that having given my attention to falconry for fifteen years, I have been naturally attracted to fishing with Cormorants. I had, in 1861, the first trained Cormorants which had been seen in France for many years, for at one time Cormorant fishing was a royal sport.* I had in my service at that time a well-known Scotch falconer, John Barr, who was clever in training all sorts of birds, and who was for a long time in India with the Maharajah Dhuleep Singh, now resident in England, where he owns one of the finest sporting estates imaginable. John Barr trained some Cormorants for me to perfection. Since that time my friends or myself have almost constantly had trained Cormorants, and I have even worked some of these birds in the water in the Jardin d'Acclimatation. I do not know at this moment whether any of my friends still keep Cormorants, but about eighteen months ago, during the autumn vacation, I trained two Cormorants perfectly for fishing which I had simply taken from the lake in the Jardin d'Acclimatation. In a fortnight they were perfectly trained, going to the water to look for fish and bringing them back, though rather unwillingly, be it understood; for it is necessary to put a strap round their necks to prevent them from swallowing the smaller fish.

M. le Secrétaire Raveret-Wattel: I may add that at the International Fisheries Exhibition in London there were a great number of Cormorants, which were exhibited by Chinese, and fished every day before the public, forming one of the great attractions of the Exhibition. All these birds were, in fact, furnished with straps, so as to prevent them from swallowing

* See the chapter on "Fishing with Cormorants" in 'Essays on Sport and Natural History,' by J. E. Harting, pp. 423—440.

the smaller fishes. I believe that at the close of the Exhibition these birds were bought by the Prince of Wales.*

M. Maurice Girard: There was an Inspector of Forests, I think, who interested himself very much about this mode of fishing, and I am not sure whether he did not make some communication on the subject to the Société d'Acclimatation.

M. Pichot: Yes, that was M. Delarue, formerly Inspector of Royal Forests, and it was with John Barr and with me that he learned to train his first birds.

M. Maurice Girard: I was under the impression that we had in our 'Bulletin' some notes from M. Delarue on the subject.

A VISIT TO THE CLAREMONT ISLANDS.

BY GERVASE F. MATHEW, R.N., F.L.S., F.Z.S.

At three o'clock on the afternoon of the 12th of April, 1885, H.M.S. 'Espiègle' anchored off No. 5 (on the Admiralty Chart) of a group of small islands, called the Claremont Islands, lying inside the Great Barrier Reef, between Cooktown and Cape York, and in latitude $13^{\circ} 42' \text{ S.}$ This group consists of eight principal islands, with a few islets, No. 1 being the farthest to the south in latitude $13^{\circ} 57' \text{ S.}$, and just off Point Claremont, while No. 8, the farthest north, is in latitude $13^{\circ} 16' \text{ S.}$, so that they extend for some forty-one miles from north to south. They are low flat islands, more or less covered with scrubby brushwood, and with a few trees in the centre, and some of them are fringed with a belt of mangrove bushes. At the time of our visit these islands were looking beautifully green.

No. 5, having no name, we will call "Espiègle Island." It is one of the smallest of the group, being little more than one and a half or two miles in circumference, and is covered with high grass, with patches of low bushes and a few trees at one corner of it. A sloping sandy beach runs round the greater part of it,

* This is a mistake: the Cormorants referred to, in the Chinese Court, were stuffed, and perched, some eight or ten in number, on the gunwale of a Chinese fishing-boat. A single live bird, however, belonging to Capt. F. H. Salvin took fish daily in one of the basins in the Exhibition grounds.
—ED.

and at low tide a large tract of coral flats and reefs, extending for several miles on each side of the islands is uncovered, and affords fine feeding grounds for numerous species of shore birds.

Soon after the ship anchored I landed in company with one of my messmates, Lieut. Allenby, to explore the island and see what it produced in the way of sport or natural history. Allenby took his gun, but I contented myself with a butterfly-net and a few collecting boxes. As we approached the island we noticed that most of the low bushes were covered with white and blue reef Herons, as was also the beach; while feeding upon the reefs, which were then uncovered, were a multitude of shore birds. Some of the latter, as we drew nearer, became suspicious and took wing, and with loud cries moved off to a more distant point along the reef. Among them I recognised the familiar notes of the Curlew, Whimbrel, Grey and Golden Plover, &c. Directly we landed, Allenby went off after the birds on the reef, while I strolled up towards the bushes to look for Lepidoptera, &c. The reef Herons were quite tame and permitted me to approach within a short distance before they took wing. While watching them, a bevy of Quail rose suddenly at my feet and quite startled me with the whirr of their wings as they flew off at an amazing pace for a short distance, and then alighted abruptly among the high grass; and I almost regretted that I had not brought a gun.

There were many interesting plants growing a little way above high-water mark, and some were in flower, but most of them, I am sorry to say, were unknown to me. However, there appeared to be several species of *Mesembryanthemum* and *Euphorbia*, and a plant which was exactly similar to, if not identical with, our English *Salsola kali*. But the commonest plant was a kind of *Convolvulus*, with fine pinkish-purple flowers and vigorous stems, which in some instances were to be observed creeping over the sand for sixty or eighty feet in a perfectly straight line. It was frequent all over the island, and is a plant which seems to flourish upon all the islands I have visited in the Western Pacific, for I have met with it commonly at Fiji, Tonga, Samoa, the New Hebrides, &c. It is a favourite food of the larvæ of *Protoparce distans*, a moth which is closely identical to *Sphinx convolvuli*.

A leguminous plant, much resembling our familiar garden scarlet-runner, was creeping in profusion over the low bushes, and numbers of a small dark metallic-blue *Lycæna* were disporting

themselves about it. They were in such swarms, and attached themselves so exclusively to this plant, that I suspected that it formed the food of their larvæ, so waited a bit and watched them, and presently observed a female settle upon one of the clusters of flower-buds, and after crawling backwards and forwards once or twice over them, and touching each individual bud with her antennæ, as if looking out for a suitable spot, she thrust her abdomen between two of the buds and deposited an egg at their base. After this I had no difficulty in finding larvæ of all sizes feeding in the flowers; the petals of all those attacked withered and drooped, so that they could easily be detected. This *Lycæna* was the most abundant butterfly upon the island; but several other species were taken, as well as a few small moths.

At six o'clock Allenby rejoined me. He had bagged twenty Plovers and Sandpipers of different kinds, and said that they were remarkably wild, and that it was no easy matter to get within shot of them. On our way to the ship a tremendous white Shark followed the boat, and at one time I really thought it was going to attack us. It was a formidable looking monster, and must have been quite ten or twelve feet long.

The next day, April 13th, the ship remained at anchor all day off the island, exercising at various drills, &c., and I was able to get on shore directly after breakfast. I took a gun, butterfly-net, and some lunch, and having deposited the heavy gear beneath the shadiest tree, put some cartridges in my pocket and proceeded to beat the island for Quail, &c. This took me about an hour, when I returned to the tree and rested for half an hour or so, and then went for an entomological ramble, returning to my tree again for lunch and rest, and so on until four o'clock, when I went on board. The time passed very quickly and pleasantly, though it was rather hot tramping through the long grass in a blazing sun. While eating my lunch, or dozing in the shade, the Herons pitched in the tree above or upon the bushes on each side, and seemed to scrutinize me very intently, and passed remarks to each other on my appearance and occupation in dismal croaks. I append a list of the birds met with.

White Nutmeg Pigeon, *Myristicivora spilorrhœa*, G. R. Gray.— Only one seen and shot. It was a young bird, apparently not more than a couple of weeks from the nest, and much smaller than

examples obtained at the North Barnard Islands in December, 1882. Its plumage, too, as far as I can remember, is slightly different, though this may perhaps be due to its youth.

Northern Swamp Quail, *Synoicus cervinus*, Gould.—These little birds were tolerably plentiful lying in the high grass, but were difficult to flush, and generally allowed themselves to be almost trodden upon before they rose. Eight couples were bagged, and double that number might have been obtained had I had the services of a good steady retriever. Unless I marked the exact spot where the bird fell, and ran to it at once, it was almost certain to be lost, as they were so difficult to find in the thick grass. They usually rose five or six at a time, but it was quite out of the question firing a double shot, as one of the birds would certainly have been lost. They varied a good deal in size, but I think I am right in referring them to the above species. They were excellent eating.

Long-billed Oystercatcher, *Hæmatopus longirostris*, Vieill.—There were several small flocks of these handsome birds. They looked very conspicuous when flying among a host of other shore birds. One I shot was a remarkably fine heavy specimen.

Grey Plover, *Squatarola helvetica*, Linn.—Common.

Eastern Golden Plover, *Charadrius orientalis*, Temm. & Schleg.—Numerous. This is decidedly much smaller than the European species, and by no means such a delicately-flavoured bird. All those that I have eaten have been obtained upon the sea-shore, or upon coral reefs, where the nature of their food probably imparts a fishy flavour to their flesh.

Red-capped Dotterel, *Ægialitis ruficapillus*, Temm.—Common.

Mongolian Dotterel, *Æ. mongolicus*, Pallas; *inornatus*, Gould.—This beautiful little Plover, with its bright rufous head and rufous band across the chest, was plentiful and conspicuous among the other species. [*Æ. inornatus*, Gould, is this bird in winter plumage.—ED.]

Australian Godwit, *Limosa uropygialis*, Gould.—Very near the European Bar-tailed Godwit.

Curlew Sandpiper, *Tringa subarquata*, Temm.—Common, and in breeding plumage.

Australian Little Stint, *T. albens*, Temm.—A few seen.

Knot, *T. canutus*, Linn.—Several shot, in breeding plumage.

Greenshank, *Totanus canescens*, Gmel.—Common.

Grey-backed Sandpiper, *Totanus pulverulentus*, Müll. — Numerous, but very shy and noisy.

Australian Curlew, *Numenius cyanopus*, Vieill. — This fine species was not common, and was so wild that it was useless to try and get a shot at it. Its size and unusually long bill at once distinguish it from its European cousin, besides which its cry is slightly different.

Australian Whimbrel, *N. uropygialis*, Gould. — Common. This is decidedly smaller than the European bird, though its call-note is identical.

White and Blue Reef Herons, *Demigretta jugularis*, Forst., and *D. Greyi*, Gray. — These were the most numerous birds upon the island, and I believe them to be one and the same species, for I have constantly seen them in all stages of plumage, passing from blue to white. There is no difference in their size or habits, and they are always found together. Unfortunately I have never been able to find them breeding, though there were plenty of nests upon the low shrubs on this island. Mr. Macgillivray, quoted by Gould in his 'Birds of Australia,' is of opinion that the two forms are specifically distinct, and states that he has never seen any exhibiting a change from blue to white, or *vice versâ*, and upon Dugong Island he had seen the young white from the nest. I have seen them in this intermediate state of plumage at the New Hebrides, Solomon Islands, Tonga, and elsewhere, and I do not think that the blue are adult birds.

Silver Gull, *Larus Jamesoni* var. *Gouldi*, Bonap. — Only a pair of these birds were noticed, and they were very vociferous as I approached a certain point of the island, flying to and fro overhead in a very excited manner, as if they had a nest or young close at hand. However, a careful search failed to disclose any. At times they came so near that I was able to observe them minutely. They were certainly larger than those to be seen every day in Sydney Harbour, and their beaks were of a dark brownish red, almost black at the tip, but otherwise I could detect no difference.

Caspian Tern, *Sterna caspia*, Pallas. — A pair seen.

Torres Straits Tern, *S. cristata*, Stephens. — Common.

Little Tern, *S. nereis*, Gould. — Several of these elegant little birds were observed and one shot. They were perfectly fearless,

and darted down upon their prey within a few yards of the spot upon which I stood.

Pelican, *Pelecanus conspicillatus*, Temm.—Only one seen, and a magnificent bird it looked as it sat in solitary grandeur far out on the coral flats, its black and white plumage most conspicuous in the bright sun. I was anxious to obtain it, but it was very wary, and would not permit me to approach within half a mile of it.

Little Cormorant, *Phalacrocorax melanoleucus*, Vieill.—Many seen flying over the island.

Amongst the scrub there were Honey-eaters, Flycatchers, two kinds of Kingfishers, and several other species unknown to me; and from one of the trees I shot a pair of large handsome Doves.

In addition to the shore birds enumerated above, three or four examples were shot of a bird which to me appeared to be identical with the European Dunlin, *Tringa variabilis*. They were in summer dress. I was surprised to find so many of these birds still in their summer plumage at this time of year, when I should have imagined they would have been in their winter dress.

[So far as we are aware, the Dunlin has not been met with in Australia, but occurring as it does in Borneo (Müller) and Java (Kuhl and Van Hasselt), whence specimens were forwarded to the Leiden Museum, we are not surprised to hear of it on the Claremont Islands, which lie in the same latitude as Java. As the specimens in question are said to have been in summer plumage (that is with black breasts), they could hardly have been confounded with any other species, since, with the exception of the much larger *Tringa crassirostris*, Temm. and Schleg., no other *Tringa* visiting Australia is similarly coloured in the breeding plumage.—ED.]

NOTES ON THE VERTEBRATE ANIMALS OF LEICESTERSHIRE.

BY MONTAGU BROWNE, F.Z.S.
Curator, Town Museum, Leicester.

(Continued from p. 421.)

Fam. ORIOLIDÆ.

Oriolus galbula, Linn. Golden Oriole.—The only note I have on this species is one by the late Mr. Robert Widdowson, who wrote that one was seen about the Railway Gardens some few years ago. It is possible, however, that this may have been a brightly-plumaged Green Woodpecker.

Fam. LANIIDÆ.

Lanius excubitor, Linn. Great Grey Shrike.—A rare winter visitant. Harley received one alive in December, 1848, which was found perched on the branch of a hawthorn bush. Its discovery and capture was attributed to a flock of Sparrows and Chaffinches drawn together by its appearance. Some days later he received a second—a fine male—which was shot in the vicinity of Knight Thorpe. Its flight was described as remarkable, being undulating, and occasionally, also, like that of a Wagtail. The two birds quoted above were mounted for Harley by Widdowson, one of which he kept for himself, the other was given to Mr. Simson, of Great Glen. Since then Widdowson informed me of a specimen picked up dead by the gardener at Little Dalby Hall on March 25th, 1883. I also purchased a poor specimen, apparently a female, for the Leicester Museum—already mounted—said to have been shot by Mr. Duffin, a keeper, between Syston and Queniborough in the autumn of 1882. I am informed that another was shot at Ansty some years since. Mr. Ingram writes, "One shot at Knipton, amongst Fieldfares, by Mr. Brewster"; and we were fortunate to receive in the flesh, from the former gentleman, a fine female specimen, shot at Belvoir 8th February, 1885. Its weight was a little over $2\frac{1}{4}$ oz. The measurements were as follow:—Wing, from carpus to tip, $3\frac{5}{8}$ in.; tarsus, 1 in.; tail, $4\frac{1}{2}$ in.; extreme length, from tip of bill to tip of tail, 10 in.; culmen, $\frac{3}{4}$ in. The stomach contained foot and fur of field-mouse.

Lanius collurio, Linn. Red-backed Shrike. ("Butcher-bird.")—An uncommon summer migrant, breeding annually. The nest, which is loose and somewhat slovenly, is generally fixed on a bough, horizontally growing in some tangled hedgerow a few feet from the ground. The foundation of the nest consists of small sticks, fibres, and twigs, with which is intertwined a little green moss, and the stalks of long grass and bents. It is lined with wool, hair, and other soft substances. Mr. Macaulay writes "not very common"; the late Mr. Widdowson "had young ones brought to him from the neighbourhood of Melton"; Mr. T. B. Ellis, of the Gynsills, writes "seen once or twice"; and I saw a fine male perched upon the dead branch of a tree in Naborough "bogs" on June 20th, 1885.

Fam. AMPELIDÆ.

Ampelis garrulus, Linn. Waxwing.—Rare winter visitant. Harley states that it appeared in the year 1827 in small parties; and again in the fall of 1835-36, when it became partially dispersed over the county, especially in the more wooded parts. During the winter of 1850-1 it was again pretty plentiful, and numbers were shot in various parts of the county. He particularly mentions one, probably fully adult, which was shot at Swanington, and adds that the food consists chiefly of the fruit of the mountain ash (*Pyrus aucuparia*, Gaertn.), the berries of the elder, and the fruit of the hawthorn. There is a specimen in the Leicester Museum which was shot near Melton Mowbray, where others have been obtained. Six or seven years ago one was shot at Belgrave; and another was shot at Ansty at Christmas, 1883, by Mr. Alfred Wm. Matts.

Fam. MUSCICAPIDÆ.

Muscicapa grisola, Linn. Spotted or Grey Flycatcher.—A summer migrant, commonly distributed, and breeding even in gardens close to the town of Leicester. Harley saw a nest fixed in a disused mortice-hole of a door-post some feet from the floor, where in due time a brood was reared, despite the constant passing of persons to and fro. Davenport writes:—"A Chaffinch had its nest, with five eggs, in a laurel-bush bordering on the lawn-tennis ground at Ashlands, in May, 1883; but, being unavoidably and so frequently disturbed,

forsook it. Three weeks later a Spotted Flycatcher appropriated the nest, laid four eggs, and successfully hatched off; repairing again to the same nest she laid a second batch of eggs. I found three eggs of a pale blue colour, with no markings, in May, 1879, at Skeffington." The old MS. Donation Book, Leicester Museum, records that Mr. W. Gimson presented "a portion of a nest and three eggs, found in an old elm tree, apparently without any external opening, on January 8th, 1853." This tree was probably one cut up at the saw-mills, Mr. Gimson being a timber merchant.

Muscicapa atricapilla, Linn. Pied Flycatcher.—A rare summer migrant.—Harley writes, "A young male was shot on the banks of Groby Pool in the autumn of 1840." Under date April 28th, 1859, he says, "Examined to-day, at Collins's, the birdstuffer, a fine male example shot at Markfield." Collins informed him that he once had a Pied Flycatcher said to have been captured in Bradgate Park. Mr. Macaulay saw one in his garden at Kibworth in May, 1859; and another was seen at Twyford, near Melton Mowbray, on May 5th, 1883, by Mr. Kestin. About five years ago a male bird of this species was taken in a barn at Wanlip. The late Mr. R. Widdowson had one killed at Melton, and I received an immature male, shot at Bardon Hill by Mr. Ward on 12th May, 1883.

Fam. HIRUNDINIDÆ.

Hirundo rustica, Linn. Swallow. — A summer migrant, generally distributed, and breeding. Harley writes that on the 31st of May, 1855, the temperature was unusually low, attended by a strong north-east wind, with heavy rain and sleet. Hundreds of Swallows and Martins perished from the cold and rain, particularly at farmsteads in Lubbesthorpe, Glenfield, and elsewhere. In May, 1885, I saw a curious variety, in the possession of Mr. W. Whitaker, of Wistow, in which the wings, tail, and back were greyish white, the throat faintly rufescent, the under parts almost of the normal colour but paler, the head and nape faintly tinged with dusky brown, the oval spots on the tail-feathers of an isabelline colour. Elkington received one pure white in 1880. At Aylestone I have found the Swallow to be treble-brooded.

Chelidon urbica, Linn. Martin.—A summer migrant, generally distributed, and breeding. The House Martin, like the

Swallow, sometimes suffers much from the inclemency of the season on its first arrival. I saw a pure white example this summer (1885) in the hands of Elkington for preservation.

Cotile riparia, Linn. Sand Martin. — A summer migrant, commonly distributed, and breeding as close to Leicester as the Aylestone sand-pits.

Fam. CETHIIDÆ.

Certhia familiaris, Linn. Tree Creeper. — Resident, generally distributed, and breeding. Mr. Davenport finds the nest and eggs every year, and Mr. Ingram showed me one containing young in June, 1884, built behind the loose bark of a tree at Belvoir. In the MS. Donation Book, Leicester Town Museum, I find the following entry:— "Remains of nest of Creeper (*Certhia familiaris*), with ten eggs, found embedded in the solid trunk of an old elm tree containing nearly 150 ft. of timber, together with the two slabs of wood, showing the cavity in which they were deposited without any opening to the exterior. — Presented by Mr. Gimson, Saw Mills, Welford Road, May 7th, 1852."

Fam. FRINGILLIDÆ.

Carduelis elegans, Stephens. Goldfinch ("Thistle Finch," "Tailor," "Proud Tailor.") — Resident and sparingly distributed. Probably no small bird has suffered more from cultivation and the enclosure of what are termed waste lands than the Goldfinch. Birdcatchers also have helped to make it scarce. Elkington receives it in small numbers in the autumn from birdcatchers from the vicinity of Leicester. Mr. Ingram writes that it "builds in apple trees; two or three pairs generally in the garden." Mr. T. B. Ellis, of the Gynsills, writes, "In one or two apple-orchards I know it builds regularly." Mr. J. S. Ellis tells me that up to 1863, when he left Glenfield Lodge, there was always a nest or two to be found every year in the orchard, and always built in a fork at the top of an apple tree.

Chrysomitris spinus, Linn. Siskin ("Aberdevine"). — A rare winter visitant. In Potter's 'History of Charnwood Forest' it is noticed as having been observed in flocks at Thringstone and Rothley Temple, among alders, during 1837. Harley some years since fell in with a vast company of Siskins (some 400 or 500), in the northern division of the county, among large alder trees beside

a stream at the lower end of Oakley Wood. In the autumn of 1849 the species was frequently met with, but has not appeared since in such numbers in any part of the county. Mr. Macaulay saw a flock of about twenty in Gumley Lane, Nov. 15th, 1882. One in the Museum, taken at Thurcaston in 1881, was presented by Mr. J. Ponsford, who kept it in a cage until it died in July, 1883.

Ligurinus chloris, Linn. Greenfinch ("Green Linnet").—Resident and commonly distributed in gardens and fields close to the town of Leicester. The eggs are very variable in size, shape, and colour. Occasionally as many as six are laid.

Coccothraustes vulgaris, Pallas. Hawfinch.—Resident. Generally distributed, but not common, except in certain seasons; breeding occasionally. Harley says, "During the winter seasons of 1830-1-2-3, the Hawfinch was abundant, and numbers were shot in many parts of the county." The MS. Donation Book, Leicester Museum, records two specimens from Atherstone, July, 1862. I received several others for the Museum in January, 1881, from Sapcote, Cropston, &c. How common they become in certain seasons may be estimated by the fact that in the winter of 1883 Elkington had twenty-one brought to him on one day from the vicinity of Ansty, and during the past three years he believes he must have had sixty or seventy. In November, 1884, I purchased two specimens, and on February 23rd, 1885, Mr. Rowley purchased two others. All were males, and were from the vicinity of Groby and Ansty. Mr. Macaulay states that Sir George Beaumont, of Coleorton Hall, has Hawfinches breeding there every year, and on Aug. 4th, 1880, a young bird was picked up dead at Gumley. Mr. Ingram writes me, "Common in the Belvoir Woods, haunting large yew trees. It is shy, builds a slight nest; the young have been taken and reared." A male, female, and five young, in the Leicester Museum, were presented by Mr. W. T. Everard, as having been taken from a nest in his garden at Bardon Hill, in June, 1867. Mr. T. Baker writes me, "Some eight or nine years ago a nest and eggs were taken from the top bough of a pear-tree in a garden opposite the Grammar School at Atherstone; both birds were shot at the same time."

Passer domesticus, Linn. House Sparrow.—Resident, and far too common, breeding everywhere. Subject to much variation

of colour. A white one was seen about Melton in 1884. It nested, and amongst the brood was one somewhat resembling the parent. The late Mr. Widdowson had a hen bird of this species dusky all over, with the margins of the primaries and secondaries dark brown, the chest and under parts being of a sooty tint. Between Aylestone and Knighton, on January 12th, 1884, I shot a male with bright chestnut wings and back, and dark chestnut throat. Another, which I shot near the Cattle Market, Aylestone Road, on February 7th, 1884, had the wings white, each feather margined with pale chestnut; upper wing-coverts and back light chestnut; head paler than ordinary; under parts greyish white, as if faded; tail, a dull white. Apparently it was a male, but dissection showed that it might be a barren female assuming other plumage. Mr. R. Hazlewood, writing on the 3rd October last, reported a snuff-coloured one. Eggs vary considerably, and Davenport writes that he took at Skeffington, in May, 1880, a white egg of this bird.

Passer montanus, Linn. Tree Sparrow.—Resident, but sparingly distributed over the woodlands. Harley found the nest in holes in trees, “especially those made by the Green Woodpecker,” and once met with nests immediately beneath those of a Magpie and Rook. The late Mr. R. Widdowson sent me one from Melton Mowbray. Mr. H. Ellis shot one at Glenfield on December 29th, 1881, and Mr. Davenport another at Skeffington in December, 1876. I killed one at Blaby on March 25th, 1884, and others consorting with Chaffinches and Greenfinches in snowy weather at Knighton in January, 1885.

Fringilla cœlebs, Linn. Chaffinch (locally “Pink,” no doubt from its note).—Resident and commonly distributed, breeding in gardens and plantations close to the town of Leicester. With regard to the flocking of hen Chaffinches in the autumn, as narrated by Gilbert White, Harley was of opinion that that writer was in error, as the birds might be immature individuals of the year, and not females, as he himself had observed. I have shot many, and found the apparent females to be, as noted above, immature specimens of both sexes. Mr. Ingram writes from Belvoir that they flock there “in thousands, and are useful in destroying the seeds of weeds.” The eggs vary: Mr. Davenport notes “an extraordinary pale green elongated egg, taken at Skeffington in May, 1879;” and Mr. W. A. Vice presented to the

Leicester Museum on May 9th, 1885, a nest containing a clutch of five eggs, entirely unspotted, and of a delicate pale blue, taken by him at Blaby. [See Zool. 1862, pp. 8091, 8161.—ED.]

Fringilla montifringilla, Linn. Brambling ("Mountain Finch.")—A winter visitant; sparingly distributed, though sometimes found in flocks. A wounded bird obtained at Swannington, and kept some time in a cage, lost all its yellow and chestnut plumage and turned dark brown, after being fed on hemp-seed. Potter, who mentions this, refers to others obtained near Glenfield, Castle Donnington, and Coleorton. During the winter of 1843-4 it was very abundant, and great numbers were shot in various parts of the county. It appeared again in the winter of 1854-5. The MS. Donation Book, Leicester Museum, records one presented on March 29th, 1860, from Barkby Thorpe. Others have been obtained at Skeffington and at Thornton Reservoir. In the winter of 1884 they were unusually numerous in Leicestershire, and I received specimens in February and March from Saddington, and from a field on the Groby Road where corn was being winnowed, and to which the Bramblings resorted in hundreds.

Linota cannabina, Linn. Linnet.—Resident and generally distributed. Harley occasionally found a nest on the lateral branch of an elm, some six or eight feet from the ground. I found a nest on June 13th, 1884, containing five eggs, now in the Museum, built in a magnolia trained on the wall of Belvoir Castle.

Linota rufescens, Vieill. Lesser Redpoll.—Resident and sparingly distributed. Harley met with its nest and eggs in North Leicestershire, in a rough place known at that time by the name of "Leake Lings." The nest was fixed in a thick gorse-bush five or six feet from the ground; it was more compact than the nest of the Common Linnet, smaller, and more elegantly woven. Davenport found a nest with three eggs in May, 1883, at Ashlands; and, according to the late R. Widdowson, it often breeds about Melton. In June, 1883, a nest was found at Kibworth, and another at Ansty on the 21st May last; both contained eggs.

Linota flavirostris, Linn. Twite. ("Mountain Linnet.")—Resident, but sparingly distributed.

Pyrrhula europæa, Vieill. Bullfinch.—Resident and generally distributed. Breeding at Belvoir, &c.

Loxia pityopsittacus, Bechstein. Parrot Crossbill.—Rare.

Harley states that it appeared in Leicestershire in 1849. With reference to this statement the late R. Widdowson wrote me, "A pair of Parrot Crossbills, killed close to Melton, are in the Bickley collection."

Loxia curvirostra, Linn. Crossbill.—A rare visitant, but has bred in the county. During the winter of 1839-40 Crossbills visited us in large flocks, and many were captured in various parts of the Midland counties. Harley recorded for the first time its nidification in Leicestershire in the summer of 1839. A pair of Crossbills took up their residence in a fir plantation surrounding the northernmost part of Bradgate Park, not far from a farmhouse known as "Hall Gates." The nest was fixed on the branch of a thick fir, some twelve or thirteen feet from the ground. The young were fledged, and disappeared with their parents. In February, 1854, Crossbills visited us in small flocks. Mr. Macaulay reports having seen one, in 1881, on August 11th, an unusual date at which to meet with it.

Emberiza miliaria, Linn. Corn Bunting ("Common Bunting," "Bunting Lark," "Writing Lark."). — Resident and generally distributed, but not numerous. Turner tells me of a pied variety of this bird which he saw caught in this county some five years ago.

Emberiza citrinella, Linn. Yellowhammer (Yellow Bunting, "Writing Lark," as the preceding, in allusion to its eggs).—Resident and commonly distributed.

Emberiza cirrus, Linn. Cirl Bunting.—Rare. Has occurred but once, on the authority of Harley, who says that he met with it a few years since, in company with the Yellow Bunting, in the lordship of Thurmaston.

Emberiza hortulana, Linn. Ortolan.—A rare winter visitant. The late Mr. R. Widdowson, of Melton Mowbray, knew of two "killed with Larks; both young."

Emberiza schœniclus, Linn. Reed Bunting.* ("Reed Sparrow").—Resident and generally distributed. I have found it breeding in the Castle reed-bed, Leicester, as well as at Aylestone, and have seen flights of immature birds at Saddington, Bosworth, &c. This bird occasionally breeds away from water; Davenport records a nest of five eggs, built in a spinney at Ash-

* This bird is often called in error the "Black-headed Bunting," a term properly applied to *E. melanocephala*, a doubtful British bird, which is yellow breasted, with a black head.

lands, May 24th, 1883; and on June 2nd, 1885, I had one brought to me, containing four eggs, from a roadside hedge at Aylestone.

Plectrophanes nivalis, Linn. Snow Bunting.—A rare winter visitant. A specimen was killed at Laughton (probably about 1865), and is now in the possession of the Rev. A. Matthews. Four others were shot at Burton Overy during severe frost in the winter of 1880-81. Mr. J. S. Ellis tells me that when living at Glenfield Lodge he remembers a small party of four or five being seen there, probably about 1854 or 1855; and Turner states that a large flock was seen by W. Bond at the Abbey Meadow some twelve or fourteen years ago. I saw a beautiful specimen, in the possession of Elkington, shot in Braunstone Lane by Mr. T. H. Ashby, Nov. 7th, 1885.

(To be continued.)

NOTES AND OBSERVATIONS ON BRITISH STALK-EYED CRUSTACEA.

BY EDWARD LOVETT.

(Continued from p. 255.)

Crangon vulgaris, Fabr.

WE have now arrived at a group of crustaceans differing very considerably from any we have as yet discussed. The *Crangonidæ*, or family of Shrimps, will occupy our attention first, to be followed by the *Alpheidæ* and *Palæmonidæ*, the latter of which comprises the Prawn family.

The central one of these three families, *viz.*, the *Alpheidæ*, are, in their general structure, more like the Lobsters than the *Crangonidæ* and *Palæmonidæ*; for we shall see that, whilst the carapace of the latter two families is thin and almost chitinous in its formation, that of the former is comparatively robust and calcareous for so small an animal as the British representatives of the genus *Athanas*, which also develops a somewhat massive little pair of forceps as compared with the pincer-feet of the Shrimps and Prawns.

The Common Shrimp is so well known that a description of it is hardly necessary; but, notwithstanding its being such a common object, considerable confusion prevails regarding it by

those who recognise it as a toothsome morsel rather than an object of Natural History.

It is quite common to hear of the distinction "Brown Shrimp" and "Red Shrimp," the preference being generally in favour of the former. Now the "Brown Shrimp" is our *Crangon vulgaris*, which in boiling never turns to the bright coral-red assumed by the Prawns when similarly treated. The "Red Shrimp," on the other hand, includes several species, and even a few genera. For example, on the Thames steamboats the "Red Shrimp" is *Pandalus annulicornis*; in Jersey I have seen *Nika edulis* sold under the same name. In Southampton I saw *Palæmon squilla* (the small Prawn) similarly hawked about; and *P. varians* has occupied a similar position in places where it occurs in sufficient abundance to be of any marketable value.

In his work on the Stalk-eyed Crustacea, I notice that Bell refers to this general term "Shrimp": he states that the smaller *Palæmonidæ* are called "Rock Shrimps," to distinguish them from *Crangon*, or the "Sand Shrimp." He also records that at Youghal the "Gray Shrimp," as *Crangon* is there called, is not much esteemed, but that the true Prawn, *Palæmon serratus*, is thought a great deal of, and is called the "Shrimp."

I will now give a short description of the species under observation. The carapace is full for so small an animal, flattened at the cephalo-thorax, or head portion, and narrowing off rapidly at the last two segments of the abdomen. The antennæ are long, and protected by a fringed scale at their base. The first pair of legs are the largest, and possess each a movable finger or terminal joint, capable of closing on to the upper edge of the main joint, affording a firm hold for the animal; the remaining legs are simple. The abdominal legs or swimmerets are rather long and slightly plumose; the ova are attached to the base of these, as in the case of other crustaceans. The ova themselves are slightly oval in form, and are exuded about the early part of the year. The tail consists of a central plate shaped like a spine, with two fringed rounded edge-plates on either side.

The colour of this species is grey or brownish grey, speckled with darker cells of pigment, but of course, like many crustaceans, this colour varies according to the habitat of the specimens; for those from a light sandy bottom are paler and slightly yellow,

whereas those from a muddy estuarine locality are dark and dirty-looking: in fact, so completely does *Crangon vulgaris* resemble in tint the bottom on which it lives, that it is absolutely impossible to detect it when motionless. I have frequently observed this in shallow clear water where Shrimps almost covered the sand; and yet, when not actually moving, not an outline could be traced or a single living thing seen, but on alarm hundreds of little flashes showed where these thoroughly invisible little things really were. I have, when collecting, touched them with my hand, and caught a momentary glimpse of them when something, such as a white shell or pebble, served as a background to show them up.

The Shrimp is an exceedingly common coast crustacean, and is much fished for, being such a generally recognised article of food. Who has not heard of the celebrated Shrimps of Pegwell Bay? I fancy from what I have seen of its distribution that it prefers the sandy stretches on the shores of cretaceous rocks to others, for in some localities it is by no means common, and these are spots of a different geological character. It has been recorded specially from Shetland, Dublin, Galway, Belfast, Berwick, the Hebrides, and from the Adriatic Sea; perhaps nowhere is it finer than from the estuaries of the Thames and the Stour. Its crustacean characteristic of having its spines, &c., pointing forwards is not always so conducive to its welfare as might be supposed. I once found a Shrimp in a tube of an Annelid, *Pectinaria belgica*; this tube is conical and composed of grains of sand cemented together. The Shrimp had backed into this empty tube tail first, expecting probably to get right through, but this of course was impossible, and so was it for him to get out again the way he had got in, for his spines prevented this most completely. How many crustaceans may destroy themselves in this way?

I may mention that the best way to tell the true Shrimp from other inferior crustaceans that are sometimes sold as Shrimps (I mean before they are boiled), is that the true Shrimp is flat on the head-part; and other sorts likely to be offered as Shrimps have a rostrum or sort of comb on the back of the head and projecting between the eyes.

(To be continued.)

NOTES ON AQUATIC MOLLUSCA OCCURRING IN THE
NEIGHBOURHOOD OF PONTEFRACT.

BY GEORGE ROBERTS.

(Continued from p. 429).

THE principal places for aquatic Mollusca in the Pontefract district are the ponds and ditches near Castleford and Fairburn on the north side, and the small River Went on the south side, together with the canals at Castleford and Knottingly. The canals, however, are very much less prolific in shells than they were five-and-twenty years ago, owing mainly to the pollution of the water. Near Castleford there are a good many ponds and ditches filled with water-weeds, and in these a considerable number of species and varieties occur, but great numbers are destroyed every year by cleaning out the ditches. Wherever the Canadian weed, *Anacharis Alsinastrum*, occurs, shells are to be found, and it is perhaps owing to the extension of this alien plant (introduced about 1841) that certain species, such as *Planorbis contortus* and *Limnæa stagnalis*, have become more frequent.

In the Rivers Aire and Calder, which are now simply great open sewers, we find absolutely nothing. Many shells may be found in the tributary streams, but in these they seem to be of very uncertain occurrence, a consequence probably of displacements and destruction, caused by floods; and, in the canals, very many are destroyed by the vessels continually passing to and fro, by dredging, and by clearing out the water-plants from the sides. Eastward of Pontefract the streams are slow-running, and the average height above sea-level may be about 100 feet.

II.--AQUATIC MOLLUSCA.

LAMELLIBRANCHIATA.

Fam. SPHÆRIIDÆ.

Sphærium corneum, Linn.—Castleford, Methley, Ackworth, and other places; common.

Var. *flavescens*, Macgill.—Castleford and Fairburn. Some are much more shining than others.

S. rivicola, Leach.—River Went.

S. ovale, Ferrus.—Once abundant in the canal near Normanton; now much scarcer.

S. lacustre, Mull.—Brick-ponds near Ackworth.

Pisidium amnicum, Mull.—Knottingly; local.

P. fontinale, Drap.—Stream at Brotherton, and in the Went.

Var. *pulchella*, Jenyns.—Ferrybridge and River Went.

P. pusillum, Gmelin.—Common. “In 1864 I collected fourteen specimens of this species from a patch of damp moss in a ploughed field where there was no ditch or other place where water could remain.”—J. Wilcock in MS.

P. nitidum, Jenyns. Shining *Pisidium*.—Said to be frequent. I once found a few specimens among damp leaves in Holywell Wood, near Pontefract, where there was no water. Mr. Wilcock has found a variety of this species with a small plate attached to the umbo, similar to the variety *Henslowana* of *P. fontinale*, but which could not be referred to the plated variety *splendens* of *nitidum*.

Fam. UNIONIDÆ.

Unio tumidus, Phil. Common Pond Mussel.—Knottingly and River Went. Much less common in the Castleford Canal than formerly. Many deformed shells occur which have been broken by vessels, by dredgers, or by other means in the canals, and then repaired. Many are repaired which have had one end rubbed or ground off by passing vessels.

Var. *radiata*, Colb.—Frequent.

U. pictorum, Linn. Painter's Mussel.—Knottingly and River Went; not so frequent as formerly. The valves of this species, smooth and pearly inside, were formerly used by painters for holding colours; hence the name. In the York Museum there is a shell of *Helix aspersa* which had been used by the Romans as a spoon; it was found, along with various other little utensils, among the *débris* of a Roman household.

Anodonta cygnea, Linn. Swan Mussel.—In the neighbourhood of Knottingly and in the River Went this species is not uncommon.

Var. *radiata*.—Near Askern.

Anodonta anatina, Linn.—River Went.

Var. *radiata*.—River Went.

Fam. DREISSENIDÆ.

Dreissena polymorpha, Pallas. Zebra Mussel. — Abundant some years since at Ferrybridge, where in some places the sides of the canal were lined from top to bottom. "Often eroded; but in some stations, very limited in extent and apparently nowise different from the contiguous parts where the eroded specimens occur, they are not eroded."—*J. Wilcock, in MS.*

PECTINIBRANCHIATA.

Fam. NERITIDÆ.

Neritina fluviatilis, Linn. River Neritine. — On stones in the shallow parts of the River Went. Formerly near Castleford. Black, yellow, brown, and variously spotted and streaked varieties occur.

Fam. PALUDINIDÆ.

Paludina vivipara, Linn. Common Marsh Shell. — Brotherton; small in size. Often much decollated.

Bythinia tentaculata, Linn. Tentacled Bythinia. — Common in nearly every stream.

Var. *ventricosa*. — "Abundant in the River Went; in some places in greater profusion than the type. Specimens of this variety, occurring in the Went, vary in colour from horn-colour to white, and also in degree of thickness, some being semi-transparent; the latter are found at Smeaton, near Pontefract, but not common."—*J. Wilcock, in MS.*

Var. *excavata*. — Common. As this variety is only distinguished by having a rather deeper suture, it should be merged with the type. Nearly all univalves vary in the depth of the suture.

Var. *alba*. — River Went, and near Askern; small.

Monst. *decollata*. — Castleford and other places; sparingly.

B. Leachii, Shepp. — Knottingly Canal, amongst the bur-reeds, and at Norton, near Askern. Specimens with a deeper suture than the recognised type, and more produced spire, are often found.

Fam. VALVATIDÆ.

Valvata piscinalis, Mull. Stream Valve Shell. — Near Castleford, and in the River Went. Monstrosities are various; some have the apex or one or two whorls intorted.

Var. subcylindrica.—River Went.

V. cristata, Mull.—Near Fairburn, on caddis-cases.

PULMONOBRANCHIATA.

Fam. LIMNEIDÆ.

Planorbis nitidus, Mull. Shining Coil Shell.—Hemsworth Dam, and roadside leading to Doncaster.

P. nautilus, Linn. Nautilus Coil Shell.—Hemsworth and other places.

Var. crista.—Said to be more abundant than the type.

P. albus, Mull. White Coir Shell.—Hemsworth, Castleford, and other places.

Var. Draparnaldi.—Said to have occurred at Streethouse, near Pontefract, and other places.

P. parvus, Say = *glaber* of Jeffreys. Smooth Coil Shell.—Found by Mr. Charles Ashford at Ackworth about 1873, and reported later from same place by Mr. Hugh Richardson. Mr. Wilcock gives "Pond at Burton Salmon; rare." I have never yet been so fortunate as to fall in with this species.

P. spirorbis, Mull. Round-edged Coil Shell.—Common.

Var. ecarinata ?.—"At Stanley I have found specimens which agreed with the description of *var. ecarinata* in being light grey in colour, and in having one whorl less than the type, but the majority were bluntly keeled. Only in very few the keel was obsolete."—*J. Wilcock*.

P. vortex, Linn. Flat Coil Shell.—Frequent near Castleford.

P. carinatus, Mull. Keeled Coil Shell.—River Went, and also in ponds at Castleford.

Var. disciformis.—Ponds at Castleford.

P. complanatus, Linn. Edged Coil Shell.—Common in ponds at Castleford, Ackworth, and elsewhere. Many of the specimens at Castleford are very concave on both sides. In some the thin keel is slightly recurved.

Var. rhombea = *P. rhombæus* of Turton.—Near Askern, and a few specimens very indistinctly keeled near Castleford.

Var. albida.—Near Fairburn, 1885.

P. corneus, Linn. Horny Coil Shell.—Abundant in two or three ponds near Castleford. In the summer of this year (1885), during the drought, they occurred in a shallow muddy pond, a dozen together, scarcely covered with water, in the horse

foot-marks. In other places I noticed them lying on the mud. Some full-grown ones were one inch and a quarter in diameter. At Askern this species is found both in a living and a sub-fossil state.

P. contortus, Linn. Contorted Coil Shell.—Frequent in ponds and drains near Castleford.

Var. *albida*.—"Three specimens from a pond at Castleford, 1869."—*J. Wilcock*, in MS.

Physa hypnorum, Linn.—Ponds and ditches near Castleford, often swum together in hundreds, dead. "Of the carnivorous propensities of this species I have had several proofs. In 1865 I put a few into an aquarium to observe their habits. In a few days afterwards I noticed four sticklebacks lying at the bottom of the tank, and several mollusks upon them. The body of the fish was eaten and the head and tail left. About a week after, other sticklebacks were devoured, but I could not ascertain whether they had been killed by the mollusks or not."—*J. Wilcock*, in MS.

P. fontinalis, Linn. Stream Bubble Shell.—Plentiful near Castleford, and at other places.

Var. *inflata*.—River Went.

Var. *oblonga*.—River Went. "In 1868 one part of the river about ten yards in length swarmed with this variety, intermixed with a few of the variety *inflata*. I have not observed them in such profusion since."—*J. Wilcock*.

Limnæa peregra, Mull. Wandering Mud Snail.—Abundant.

Var. *ovata*.—One of the commonest varieties.

Var. *acuminata*.—Ditches at Ackworth.

Var. *oblonga*.—Canal at Knottingley.

Var. *labiosa*.—Whitwood and Castleford.

L. auricularia, Linn. Ear-shaped Mud Shell.—River Went, and disused quarry at Hillam.

L. stagnalis, Linn. Lake Mud Shell.—Abundant at Castleford. Specimens occur in ponds which have the last whorl very much enlarged and somewhat square in form.

Var. *fragilis*.—This form, which some conchologists consider a distinct species, is common in the Castleford drains. It is somewhat difficult to distinguish when associated with immature specimens of the type. In May of this year I observed several thousands of this variety with young of the type in a narrow

dyke in a grass-field near Castleford; in fact, the bottom of the dyke was paved with them, but there were no adults of the type, except one or two dead ones. The shells are often slightly covered with *Confervæ*, but when cleaned they appear of a very fine and somewhat ruddy horn-colour. *Apropos* of cleaning, I may remark that some care is necessary, otherwise the thin edge of the mouth will become chipped. I usually soak them nine or ten hours in soap and warm water, with a little soda, and then brush them well with a hard tooth-brush, keeping the brush well soaped.

L. palustris, Mull. Marsh Mud Shell.—Near Methley, and near Milford. I have not seen it anywhere nearer to Pontefract. Although described in books as common, it is not so in this district.

L. truncatula, Mull. Small Mud Shell. — Frequent, but less so than formerly. I have often rambled a whole day without seeing one.

Var. *major*.—Castleford.

Var. *elegans*.—Methley.

L. glabra, Mull. Elongated Mud Shell.—Near Castleford, and near Ackworth.

Var. *elongata*.—Castleford, in company with *Physa hypnorum*.

Ancylus fluviatilis, Mull. River Limpet.—River Went, and near Brotherton.

Var. *capuloides*.—Wentbridge and Ackworth. “In 1864 the stones at the bottom of the shallow places in the Went were one compact mass of this variety, but a strong flood in the autumn swept nearly all the stones and shells away. Light horn-coloured specimens often occur, which might easily be mistaken for the variety *albida*.”—*J. Wilcock*.

L. lacustris, Linn. Oblong Limpet.—In Lord Houghton's fish-ponds at Fryston; also at Castleford and Ferrybridge.

Var. *albida*.—In the River Went, on leaves of the water-lily; rare.

(To be continued.)

NOTES AND QUERIES.

'The Zoological Record.'—It has been found that a condensed Record of all that appears each year in the scattered literature of all parts of the globe, on any branch of Science, is of most essential service to all scientific workers, and 'The Zoological Record' was started in 1865 in order to supply this great desideratum for all branches of Zoology. Twenty volumes of 'The Zoological Record' have already appeared, and it was sanguinely hoped that by this time the subscribers to the work would have become sufficiently numerous to make it self-supporting, or nearly so. This, however, has not yet been the case, partly owing to the increased cost of the publication (arising mainly from the continuous increase in serial scientific literature, which has all to be examined and collated by the Recorders), and though valuable assistance has been received from the British Association for the Advancement of Science, also, formerly, from the Zoological Society of London, and more recently from the Government Grant Fund of the Royal Society, there is yet considerable risk that the work will have to be discontinued unless an increased amount of support can be obtained from new subscribers. The annual volumes (stout octavos, which have latterly run to between seven and eight hundred pages) are sold to the public at thirty shillings. The volumes are supplied to subscribers in return for an annual payment of twenty shillings. After the first six volumes of 'The Zoological Record' had been brought out by Mr. John Van Voorst, at his own risk, the Zoological Record Association was founded in 1871, as the most probable means of successfully continuing the undertaking, which would otherwise have dropped at the close of the sixth volume. The Association has continued the work up to the present time. There are, probably, many local Libraries and Natural History Societies which would be quite willing to become subscribers to the work, especially if it were known that by so doing they would probably ensure the continuance of the publication, or at any rate avert the possibility of any immediate collapse. The Zoological Record Association consists of members and subscribers. Members are public-spirited persons, who receive a copy of the annual volume, and make themselves liable to the extent of five pounds, in the event of the funds from all other sources not being equal to meet the annual expenditure. When this amount of five pounds has once been reached, members can either withdraw, or renew their membership and thereby incur a fresh liability. The average cost to members of the volumes already issued by the Association has been twenty-four shillings. Subscribers pay annually, on the 1st of July, twenty shillings, but incur no other liability; in return for this they receive the volume containing the "Record of Zoological Literature" of the preceding year as soon as published. There

are, probably, many who would gladly aid Science by contributing an annual subscription to keep up 'The Zoological Record,' but who, perhaps, till reading these lines, have been unaware of its existence. Anyone wishing to join in the good work should forward his name as soon as possible to the undersigned, who will be glad to hear from the Secretary of any Natural History Society, Scientific Institution, or Public Library, wishing to be enrolled amongst the subscribers to the Zoological Record Association.—H. T. STAINTON, Secretary (Mountsfield, Lewisham).

[We are very glad to publish this appeal on behalf of 'The Zoological Record,' for it would be a great pity if so useful a publication, so long established, were now to be withdrawn for want of support. We trust that the Secretary of every local Natural History Society throughout the kingdom will bring the matter before the council or committee of management of his Society, and as a result be empowered to subscribe regularly for the annual volume. Societies professedly formed for the furtherance of zoological science will surely not grudge the annual payment of £1 to secure a work which is admitted by all practical zoologists to be so extremely useful. As an illustration of its utility we may observe, for the benefit of those who are unacquainted with the work, that anyone proposing to write a zoological paper for the 'Proceedings' or 'Transactions' of any Society to which he may belong, may discover, by reference to 'The Zoological Record,' all that has been published in any language on his particular subject during the last twenty years (that is, since the publication commenced), each annual volume containing the classified titles of all books and papers on Zoology published during the preceding year. The saving of trouble to the writer thus ensured is incalculable.—ED.]

MAMMALIA.

Deer striking with their Fore-feet.—I was surprised to find by the last two numbers of 'The Zoologist' (pp. 397, 430) that it is considered anything out of the common that Deer should defend themselves with their fore feet—*i. e.*, defend themselves from enemies not of their own kind, for the horns are, of course (during their season), the natural offensive and defensive weapons, at least among the male animals for fights *inter se*. When Mountain Lapps milk their herds of tame Reindeer, it is quite a common occurrence to see a doe, as soon as she feels the lasso round her horns, rear up on her hind legs, and strike out with her fore legs "from the shoulder," in a way worthy of a prize-fighter. Of course, in this case, they are debarred from the use of their horns by the lasso; but in stalking wild Reindeer, it chances occasionally that one stops an animal with a bullet somewhere too far aft, and it remains standing on all four legs, but allows one to come up with it. One has then to catch it by the horns,

throw it over, and plunge a knife into its heart. On approaching it one speculates on the amount of strength it retains, much more with regard to its fore legs than to its horns. And in Elk hunting I have frequently been cautioned as to the danger of approaching the animal when shot before one is quite certain that it is dead, on account of the enormous power of its long fore-legs, but have never heard a word about the horns. I cannot speak from personal experience of Elk, as I have never been lucky enough to get a shot at one, although I have several times been quite close to one.—A. H. COCKS (Great Marlow, Bucks).

An Albino Leveret.—A short time since there was alive, and for sale, in the Plymouth Market, a pure white Leveret with pink eyes, apparently about six or seven weeks old. It had been confined in a large cage for over a fortnight, after which it was purchased by Mr. Robert Bayly, of Tor Grove, near Plymouth, in whose possession it now is. It fed well, and when I last saw it, seemed to be in perfect health. On inquiry I found that it had been sent to Plymouth from North Devon, where it was captured.—J. GATCOMBE (Stonehouse, Devon).

Habits of the Squirrel.—Walking through Farnborough Park, Warwickshire, in the afternoon of October 18th last, I watched for some time a pair of Squirrels, which were busy gathering beech-mast and carrying it to their winter retreat in some thick spruce firs adjoining the beech trees. As the mast grows at the extreme outside of the trees, and only at the ends of the slender drooping twigs, and usually out of (Squirrel) reach of any of the thicker branches, I imagined they had to content themselves with the fallen nuts. But I found that they ventured boldly out into the small twigs, and, hanging on by their hind legs, drew the mast to them with their fore-paws and bit it off, when, with the exercise of the greatest agility, they twisted round, and with a quick jump regained the stronger branches. Of course, a good deal of the mast fell to the ground, and *Sciurus* seemed occasionally to get quite out of temper with a refractory twig which refused to come to hand; when this happened, the angry, impatient snatches made by the little animals were quite amusing. No doubt they felt their position precarious, for the breaking of a twig or the slip of a claw meant a clear twenty-foot drop, with nothing to catch at; no great matter, of course, to a Squirrel when it throws itself off a bough to drop, parachute-like, to the ground, but quite another thing when taken as an unexpected fall. With regard to their alleged egg-sucking propensities, I remember once, years ago, on visiting a Missel Thrush's nest in an orchard joining a plantation inhabited by Squirrels, we found the eggs "sucked"; they were slightly broken and exhibited teeth-marks, such as would be made by a Squirrel's incisors, very plainly. We had no doubt at the time about the robber. I think the light colour of the tail is—sometimes at least—an individual

variation not dependent on age or change of coat. In some large trees on the lawn of the house near where the above occurrence took place, there was, one summer, a nest of young Squirrels with very light-coloured tails—nearly white, in fact. I often saw them about the place after they were full-grown, when they had a very striking appearance.—OLIVER V. APLIN (Great Bourton, Oxon).

The Beaver in Norway.—In Christiania, on October 22nd, I had the melancholy pleasure of examining, in the flesh, an adult male Beaver, which Prof. R. Collett kindly took me to see in the University Museum. It had been shot on the 14th at the principal Beaver colony in the South of Norway. Prof. Collett informed me that it measured 1 mètre 20 mm. in total length (about 3 ft. 4·1 in.); the tail 251 mm. (about 10·2 in.); weight, just 18 kilos (about 39 lbs. 10 oz.). The skull was entirely smashed by a shot at very close quarters, so it could not be made into a skeleton, but the skin was to be mounted for the Museum, and the loose bones preserved.—A. H. COCKS (Great Marlow, Bucks).

Attempted Acclimatisation of the Dormouse in Ireland.—I have to-day (November 13th) set free six healthy Dormice which I received from London. They have been released in a thicket near some hazel-bushes. The Dormouse is not an Irish quadruped, and it may be as well to place on record an indication of what is, so far as I am aware, the first "centre of introduction" in Ireland.—R. M. BARRINGTON (Fassaroe, Bray, County Wicklow).

BIRDS.

Occurrence of the Desert Wheatear in Yorkshire.—Through the kindness of Mr. P. W. Lawton, I received what purported to be "a light variety of the Wheatear," shot between the villages of Easington and Kilnsea, on the Holderness coast, on October 17th last. A glance at the specimen, however, at once suggested a rarity, and on examination a suspicion that it was *Saxicola deserti*, Temminck. This surmise as to the species has been confirmed by Prof. Newton and Mr. H. E. Dresser, who kindly examined and compared the bird, which, being tailless, rendered certainty in identification a matter of some difficulty. The specimen is a female, though it was too much shattered to prove it to be such by dissection; it is now in my possession, and was exhibited by Mr. Dresser at the meeting of the Zoological Society on the 17th ult. It is the first English specimen; the second British—one having been shot in Clackmannanshire on November 26th, 1880; and, I believe, the fourth occurrence of the species in Western Europe—two having been obtained on Heligoland. This bird appears to be an accidental visitant to countries north of the Mediterranean, its true home being the desert regions of Northern and North-eastern Africa, extending eastwards through Persia to North-west India.—WM. EAGLE CLARKE (Leeds).

Purple Sandpiper in Nottinghamshire.—When shooting near here on September 25th a tramp brought me a bird which he had just picked up under the telegraph-wires. It was a Purple Sandpiper (*Tringa maritima*), and, I need hardly say, I was as pleased to give as he was to receive a shilling for it. This maritime species had occurred but very few times in this county, which is situated far from its usual haunts, and this is the only county-killed specimen I possess.—J. WHITAKER (Rainworth Lodge, Notts).

Roller near Norwich.—On October 24th an adult female Roller was shot at Felthorpe, seven miles from Norwich. It was seen in the same spot three days previously by the person who eventually shot it. Just twenty years have elapsed since the first example of this uncommon bird passed through my hands—an adult male, which was caught in the rigging of a vessel off the Yarmouth coast ('Huddersfield Naturalist,' 1865, vol. ii., p. 64). This bird has recently been added to the Norwich Museum. I found on dissection that both had been feeding on the tumbler dung-beetle.—T. E. GUNN (Norwich).

Breeding Places of the Fulmar.—Referring to 'The Zoologist,' 1879, p. 380, I find that an editorial note quotes the statement of Mr. Robert Gray ('Birds of the West of Scotland,' p. 499), to the effect that *Fulmarus glacialis* "breeds" on a Stack off the Skye coast. I have the authority of Capt. Cameron, who supplied the original note, for stating that he was misled by his informants, and that the species which nests upon the Stack in question is not the Fulmar, but the Manx Shearwater. Should I be able to visit the Stack personally, as I hope to do, I shall be glad to report further.—H. A. MACPHERSON (Carlisle).

Eared Grebe at Hunstanton.—On November 7th I received from Hunstanton an adult example of the Eared Grebe, showing traces of the summer plumage on the head. The eyes of this specimen were orange-yellow, not red, as usually described in ornithological works.—JULIAN TUCK (St. Mary's, Bucknall, Stoke-on-Trent).

Recent occurrence of the Nutcracker in Kent.—Your readers will be interested to hear of the recent occurrence in Kent of the Nutcracker, *Nucifraga caryocatactes*, a bird sufficiently rare in this country to deserve notice. The specimen referred to was shot by me on Nov. 17th near Eddington. I saw this bird two days before it was shot, and had good opportunity of observing its movements, which appears to partake of those of the Jackdaw and Magpie. It was flying from an elm tree to the ground, and raking among the fallen leaves with a sharp busy motion, quite undisturbed by the presence of myself and a friend, whose attention I called to the indifference which the bird displayed. Although I spoke very loudly, to try the effect, no notice was taken, and it was only the abrupt appearance of a

fox-terrier on the scene that caused the bird to take refuge in the tree overhead. We were standing within forty yards, and it allowed the dog to approach within a yard of it before taking wing.—COLLIS WILLMOTT (Eddington Cottage, Eddington, Kent).

[If our correspondent will refer to the Editor's 'Handbook of British Birds' (pp. 118, 119) he will find reference to many more recent occurrences of this bird than those mentioned in the old records quoted by him, which we have consequently struck out. One observed in Somersetshire in August, 1873, is noticed in 'The Zoologist' for that year (p. 3689).—ED.]

Note on the Red-throated Diver. — A bird of this species, which was hanging in Leadenhall Market on November 5th, and apparently had been killed but a few days previously, was in full adult breeding plumage, with the exception of a slight sprinkling of small white feathers on the chin and cheeks; but it had lost all the quill-feathers from both wings, and, I presume, had moulted them. As the above date seems to me to be a late one for the assumption of the winter dress to be just commencing, I think the above may be worth recording; but I would take the opportunity of referring to some interesting remarks on this subject by Mr. H. Blake-Knox in 'The Zoologist' for 1870, p. 2183, and also to those in Audubon's 'Ornithological Biography,' vol. iii., p. 21. — J. H. GURNEY (Northrepps, Norwich).

Unrecorded Occurrence of the Whiskered and Roseate Terns. — At the sale of the late Mr. Rising's collection of birds, which took place at Horsey, near Great Yarmouth, on September 17th last, most of which were of local interest, there were two birds from other counties which I think should be placed on record, as I am not aware that either of the species are known to have occurred in the counties named. I am indebted for the localities and dates to the kindness of Mr. George Frederick, into whose collection both birds came in the first instance, and passed direct from him to the late Mr. Rising. The Whiskered Tern, *Hydrochelidon hybrida*, was shot on the River Swale, at Hornby Castle, Yorkshire, by one of the Duke of Leeds' gamekeepers in 1842. At the recent sale by auction this bird passed into the possession of Mr. W. H. Jeary, of Burlingham Hall, Norfolk. The Roseate Tern, *Sterna dougalli*, was shot on the Sussex coast, near Eastbourne, about the year 1848. It was purchased at the auction by Mr. Ashmead, the taxidermist, of Bishopsgate Street, London. — THOMAS SOUTHWELL (Norwich).

Grey Phalarope at Mansfield. — One of these birds was shot on the Reservoir at Mansfield on October 17th by Mr. Tomasson, who kindly offered it to me. It is in full winter plumage, and (as usual) was very tame. This species has occurred once before on the same piece of water, and a few times in other parts of this county.—J. WHITAKER.

The Green-backed Porphyrio near Norwich.—A good specimen of this species was shot by the river-side at Horning on October 16th, and was brought to me the following day. This makes the fourth example out of five killed in Norfolk that has passed through my hands. The present specimen proved to be a female, and weighed one pound five ounces and a half. The gizzard contained a quantity of small white stones and grit, together with some small brown seeds of a species of rush. — T. E. GUNN (Norwich).

Night Heron and Pied Flycatcher in Clackmannanshire.—The Night Heron killed in Clackmannanshire, referred to by Mr. Erskine (p. 434), is evidently the same as that recorded in 'The Zoologist' for 1879 (p. 382), and by Mr. R. Gray, Proc. Roy. Phys. Soc. Edin., vol. v., p. 355. The Pied Flycatcher has been found in several places in Scotland this season, and even breeding.—JOHN J. DALGLEISH (Athole Crescent, Edinburgh).

Uncommon Birds in the Isle of Wight.—I am glad to be able to state that in the Freshwater cliffs, this year, the Peregrine reared its young in safety, which it is seldom allowed to do. A Green Woodpecker (an uncommon bird in the Isle of Wight) has been recently obtained, and the Black Redstart, Grey Phalarope, and Pied Flycatcher (not an infrequent visitant of late years) have all occurred during the past autumn.—HENRY HADFIELD (High Cliff, Ventnor, Isle of Wight).

Redshanks nesting in Notts.—I am glad to be able to state that five or six pairs of Redshanks nested in some low rushy meadows in the north of this county last spring. I never came across them before in Notts, and need hardly say how delighted I was at this discovery. The exact locality is best kept a secret, though, from what I heard, they reared their young in safety.—J. WHITAKER (Rainworth Lodge, Notts).

Wood Sandpiper on Hackney Marsh.—On the 31st August last I received, for preservation, a Wood Sandpiper (*Totanus glareola*), which was shot on Hackney Marsh, near Temple Mills, and had been seen about there for eight or ten days previously.—B. HESSE (Chisenhale Road, Old Ford).

FISHES.

The Young of the Garfish.—In your last issue, at page 439, is a communication from Mr. Cornish "On the Young of the Gar-fish," wherein he claims that the observations he adduced "have disposed of the 'Half-beak' Fish, in which Yarrell apparently had no faith." The history of this fish is as follows:—Mr. Couch, in 1818, obtained a young Garfish, about one inch long, in the Polperro Harbour; this he noticed in the 'Linnean Transactions,' vol. xiv., p. 85, suggesting that it might be the *Esox Brasiliensis*, Linn. Fleming, in his 'History of British Animals,' 1828, p. 184, observed, under the head of Gar or *Belone*, "The fish to which

Mr. Couch refers as probably *Esox Brasiliensis*, Linn., seems to be the young of this species." On August 18th, 1837, Dr. Clarke, of Ipswich, transmitted to Mr. Yarrell a fish 5·8 in. long, and which is figured half the natural size in the 'Magazine of Natural History,' 1837, p. 507, as *Hemiramphus Europeus*, Yarrell. Mr. Couch, in 'The Zoologist,' 1848, p. 1978, redescribed this fish from examples secured in Mounts Bay in 1846, giving two figures, and at the same time remarked on what he supposed to be a new species, *Hemiramphus obtusus*, Couch, from a specimen half an inch long, captured in 1841, and of which he gave three delineations. In Yarrell's 'British Fishes' (3rd ed. 1859, vol. i. p. 472) it is observed, "These notices would lead us to believe that the *Hemiramphus europeus* is in truth the fry of the *Belone*, and that *H. obtusus* is an early stage in the growth of the young fish." In the 'Catalogue of the Fishes of the British Museum,' vol. vi. 1866, p. 254, not only are the above references to be found as the young of the *Belone vulgaris* or Garfish, but in the succeeding page Couch's own specimen is recorded as among the examples of this fish preserved in the National Collection. In Professor Lütken's splendid 'Spolia Atlantica,' 1880, p. 567, the development of this fish is traced from its fry to its more maturest age, and five figures are likewise given, showing the changes which occur when the head, including the beak, is only about 0·3 of an inch long, until it successively reaches 0·5, 1·0, 1·9, and 2·8 inches. All these facts and references are to be found in my 'British and Irish Fishes' (vol. ii.), and at p. 149 a description is given of specimens from our south coast commencing under one inch in their entire length and continued up to those in which the length of the head only was 2·8 in. In plate 127 I have figured both the head of the young and the egg with its curious filaments; while for most of my specimens I must express my indebtedness to my excellent correspondent, Mr. Dunn, of Mevagissey, from whom Mr. Cornish has now received some similar examples. From their examination he does not appear to have arrived at any different conclusions from those already ascertained as well as recorded by previous writers.—FRANCIS DAY (Kenilworth House, Pittville, Cheltenham).

Pike and Water Vole. — On August 4th, the river being rather low, there was exposed, in many places where the banks are steep, a narrow ledge projecting a few inches beyond the face of the bank, which is usually above water. Along such a ledge on that day, a short distance below here, I saw a Water Vole running, when suddenly a large fish—I have little doubt it was a Pike, but cannot be certain—thrust its head right out of the water and grabbed at the rat, though it was some three inches clear of the water; the rat made a spring out of the way, and continued scuttling along the ledge until it reached the nearest hole. That a Pike should take a rat when in the water would be nothing out of the common, but an attempt to

take one when on dry land some inches clear of the water is, I think, worth putting on record.—A. H. Cocks (Great Marlow, Bucks).

Ray's Sea Bream on the Norfolk Coast.—A fine example of Ray's Sea Bream, *Brama Raii*, was caught on October 30th in a small trawl-net off Palling Beach. I purchased it the following day from the man who captured it, and now have it preserved. It had a metallic appearance not unlike lead, but still retained a silvery sheen in some parts, not near so bright, however, as when caught. The scales beneath the pectoral fins had a worn appearance, as if the constant working of these organs had rubbed the silver off; these fins were long and pointed. The lower jaw projects considerably beyond the upper when the mouth is open, both jaws being armed with rows of sharp-pointed teeth. It measured two feet in length from nose to end of deeply-forked tail, and eight inches in depth. It weighed five pounds and a half, which is one pound heavier than the specimen received by Buckland from Alnwick, as recorded in his 'Natural History of British Fishes.' Its stomach contained but a little gelatinous matter. This species is decidedly rare on the East Coast of England, and has only occurred on two previous occasions, so far as I am able to learn, viz., one now preserved in the Norwich Museum, and a second seen by the Rev. E. W. Dowell at Norwich on January 25th, 1847. Both these were caught off Yarmouth.—T. E. GUNN (Norwich).

MOLLUSCA.

The Mollusca of East Sussex.—We have received from Mr. J. H. A. Jenner, of Lewes, a copy of his 'List of the Land and Freshwater Mollusca of East Sussex,' reprinted from the Proceedings of the Eastbourne Natural History Society, 1884-5. Ninety-seven species belonging to thirty genera are recorded, and include seven forms not mentioned in our list for Sussex published in 'The Zoologist' for 1878 (pp. 84-94, 122-6, 181-8). These additions are:—*Sphærium ovale*, *Pisidium roseum*, *Unio tumidus*, *Anodonta anatina*, *Limnæa glutinosa*, *Amalia gagates*, and *Bulimus acutus*. The last named has been found only in the neighbourhood of Eastbourne, where it may possibly have been introduced. On the other hand, doubtless by accident, *Paludina vivipara*, which occurs on the Pevensey Level, has been omitted. *Dreissena polymorpha* is only mentioned to show that it has not yet been met with in the county. The list is swollen by a large number of the now fashionable "vars."

The Mollusca of Northamptonshire.—The Journal of the Northamptonshire Natural History Society and Field Club (vol. iii. 1885, 281-8) contains a "Supplementary authenticated list of the Mollusca of Northamptonshire," by W. D. Roebuck and J. W. Taylor. Seventy-seven species and thirty-three varieties (!), or, as we make it, forty-five (!), are

now recorded for this county, so that, as the authors say,—previously remarking that all the specimens have been submitted to *them*,—"Northamptonshire, which till within the last decade was one of the *terra incognita* of Conchology, bids fair to become one of the most systematically and most intelligently investigated counties of Britain."

Varietal Nomenclature.—May I be allowed a few words in answer to Mr. Woodward's remarks (pp. 408-414). It appears that we start on common ground; we both agree that it is expedient that varieties should be described, and that variation ought not to be ignored; but it is in the method of making them public and of subsequently referring to them that we differ. I have already explained my views on this subject (Sci. Gos. 1885, p. 179, 180), and will therefore not go over them again, but will confine my line of argument to the case in point. If, then, varieties are to be described, they must either be described in Latin or in the native language of the describer. The international character of Latin seems to me an unanswerable argument in favour of its use. Mr. Woodward, however, writes of his varieties in English terms, as, for instance, his "rufous type" of *H. arbustorum*. Suppose we change this term into Latin; what is the result? We have it simply reduced to *H. arbustorum*, var. *rufa*, or its equivalent. Having, then, so easily produced one varietal name by a mere translation of the name Mr. Woodward uses, what rules shall we observe in the production of similar ones? I would suggest the following:—1. Avoid a combination of many characters, but as far as possible give a name to each character, and in a specimen having, like var. *Baylei*, many characters, mention as many names as there are distinct characters. 2. Except in some geographical varieties or subspecies, when certain unusual characters are always associated. 3. Let the name you give describe, as nearly as possible, the abnormal character it refers to. 4. Name no varieties (or, for the matter of that, species) after individuals, nor, except in some exceptional instances, after the habitat. (The use of the word "variety" is by no means essential; the Americans dispense with it in their trinomial system.) If these rules were followed, var. *Baylei* would become *H. arbustorum*, var. *minor*+*conoïdea*+*tenuis*+*virescens*+*unicolor*. Rather a long name, or set of names, but I think that what is lost in length is gained in clearness and accuracy. These names should not be loosely applied, but each one should refer to a definite character, and the same name should be used to express the same character in every species in which it occurs. Nevertheless, the law of priority should not be infringed, unless, at least, a majority of those concerned can be shown to be in favour of the reform, and, until it is so proved, to avoid still greater confusion, we should continue to use the term *Baylei*. The best way, I think, to get over the difficulty would be to submit the matter to the vote of those interested, and abide by the result. To sum up: if I had the remodelling

of the varieties of *H. arbustorum*, I should give them as follows, adopting Mr. Woodward's order, each one with a description:—*H. arbustorum*, (a) varieties of the shell. (1), in colour, *flavescens*, *rujescens*, &c.; (2), in markings, *unicolor*, *efasciata*, &c.; (3), in thickness, *tenuis*, *crassa*; (4), in size, *major*, *minor*; (5), in shape, *depressa*, *conica*, *sinistrorsa*, &c.; (6), combinations, *major-depressa*, *tenuis-efasciata*, &c. (b), varieties of the soft parts. Many of the above varietal names are now in use, but some, especially the combinations, now stand under other names. The ! after Lecoque's name, which seems to puzzle Mr. Woodward, is merely a certificate of authentication. — T. D. A. COCKERELL (51, Woodstock Road Bedford Park). [Or, placed after the name of a locality, it may denote that that locality is a new one for the species.—Ed.]

Science versus Nomenclature.—I am glad to see that my friend, Mr. B. B. Woodward, has entered a well-timed protest in the name of true Science against the tide of misdirected energy, which at the present time bids fair to flood our scientific literature, and render useless to the progress of Science an expenditure of zeal upon a scale worthy of a better cause. I refer to the wholesale manufacture of varieties (so-called) to express differences of extremely doubtful value which present themselves, apparently for the first time, to the eye or the imagination of several well-intentioned student observers. The study of Conchology is one that admits of special facilities in this direction, and it is to this branch of Natural History that our attention is more urgently attracted. The recording of every variation or slight departure from a normal type—whether the variations relate to colour, markings, dwarfing, or what not; or the slightest variation in, or departure from, a recognised type-form in one particular feature or structural portion of a shell—is a very useful habit, and far be it from my intention to seek to discourage such observation, or to depreciate or cast a slight upon its true value. For it is only by bestowing close attention upon individual differences that we can arrive at the sum of the liability to variation presented by any one species. The value which we would assign to an individual variation must be governed by certain well-ascertained generalisations which apply to the species as a whole. We cannot properly recognise as true variations such points as size or colour, perfection or imperfection, monstrosities, &c., because these are variable characters belonging to, and shared equally by all the members of a species, and should for this reason be excluded from a systematic classification resting upon a scientific basis. The pursuit of true Science insists upon a due share of respect being paid to the term "variety," as a term, the right understanding and appreciation of which assigns to it its due rank in the classificatory system. If this were not so, and if every so-called variation that presents itself within the limits of a species were to be tacked on to the name of that species, we should fall into a method of classifying in

which it would be next to impossible to discriminate between important or "intermediate" variations, and those which were insignificant, unstable, and individual in character. Such a classification, too, would serve to impart a considerable degree of colour to the belief in the immutability of species, because the significance of the important variations would be lost sight of in the observation and chronicling of trifling and commonly variable characters. Whilst, therefore, I do not desire for one moment to cast the slightest doubt upon the earnestness of spirit in which these investigations are pursued by many of the young observers of the present day, I deprecate most strongly the addition to our scientific nomenclature of varietal names which cannot be of use, but only disfigure and overload our classification, and help to clog the channels through which alone the haven of true Science can be reached.—F. J. ROWBOTHAM. [We entirely concur in this view.—ED.]

Mollusca of Middlesex.—The following important correction affords an illustration of the occasional inaccuracy of the published records:—In the August number of 'The Zoologist' *Limnæa glutinosa* is recorded for Barnes, on the authority of Messrs. Loydell and Rowe. Mr. Rowe now tells me that the specimens were wrongly identified, and that the record is therefore erroneous.—T. D. A. COCKERELL.

The Mollusca of Kent, Surrey, and Middlesex.—I can add the following species and varieties to my brother's list, found for the most part since its compilation:—*Pisidium roseum*, Fulham. *Planorbis corneus* var. *albinos*, West Moulsey, Surrey. *Limnæa auricularia* var. *ampla*, River Thames at Hampton, very fine. *L. peregra* monst. *sinistrorsum*: I took several specimens of this rare form near Tooting towards the end of September, associated with the type and *Planorbis nautilus*. *Cardium fasciatum*, Margate. *Lepton Clarkia*, in shell-sand from Margate with *Cyamium minutum*, *Crenella rhombea* (single valves), *Rissoa inconspicua*, *R. semistriata* var. *pura*, *Odostomia conoidea*, *O. spiralis*, *O. dolioliformis*, *O. interstincta*, *O. rissoides*, *O. indistincta*, *Cæcum glabrum*, and others already recorded for this district.—SYDNEY C. COCKERELL (Bedford Park).

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

November 5, 1885.—Sir JOHN LUBBOCK, Bart., F.R.S., M.P., President, in the chair.

Mr. Alfred E. Heath exhibited a Golden Eagle in the plumage characteristic of the second year.

The first part of an exhaustive monograph "On Recent Brachiopoda," accompanied by illustrations, by the late Dr. Thomas Davidson, was read by

the Secretary. In this the author reviews the labours of his predecessors in the same field, with regard to the shell, the anatomy of the adult, and the embryology. As regards the perplexing question of affinities, he remarks:—"Now, although I do not admit the Brachiopoda to be Worms, they, as well as the Mollusca and some other groups of Invertebrates, may have originally diverged from an ancestral vermiform stem, such as the remarkable worm-like mollusk, *Neomenia*, would denote." He lays stress on the Brachiopodous individual being the product of a single ovum, and not giving rise to others by gemmation. He considers that the shell, the pallial lobes, the intestine, the nerves, and the atrial system afford characters amply sufficient to define the class. The greatest depth at which a living species has been found alive has been 2990 fathoms. As to classification, he groups the recent species in two great divisions, viz.:—I. *Anthropomata* (Owen) = *Clistenterata* (King); II. *Lypomata* (Owen) = *Tretenterata* (King). The *Anthropomata* he divides into three families:—(1), *Terebratulacea*, with seven subfamilies, thirteen genera and subgenera, seventy species, and twenty-one uncertain species; (2), *Thecideida*, with one genus and two species; (3), *Rhynchonellida*, one genus, one subgenus, and eight species. The *Lypomata* he also divides into three families, five genera and subgenera, twenty-three species, and seven uncertain species: (1), *Craniida*, with one genus and four species; (2), *Discinida*, with one genus, one subgenus, and eight species; (3), *Lingulida*, with one genus, one subgenus, and eleven species. He does not accept M. DeLongchamp's scheme (1884) of classifying the *Terebratulina*, bringing forward Mr. Dall's observations on *Waldheimia floridana* of delicate spiculæ in the floor of the great sinuses as telling evidence against the arrangement. The various genera and species are then dealt with, followed by remarks on the *Terebratulacea*, with copious descriptions and observations.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

November 3, 1885.—Prof. W. H. FLOWER, LL.D., V.-P.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August, and September, 1885, and called attention to certain interesting accessions which had been received during that period. Amongst these were specially noted a Spurred Chameleon, *Chamaleon calcarifer*, from Aden, presented by Major J. W. Yerbury; and a fine series of Australian Reptiles, received in exchange from the Zoological Society of New South Wales.

Mr. Selater exhibited the skull of a Tapir received by the Society in May, 1878, which was then described as *Tapirus roulini*, but which had since been found, upon anatomical examination, to be merely a dark variety of *Tapirus americanus*.

A letter was read from Mr. J. Cardwell, of Port Louis, Mauritius, announcing the discovery of a new deposit of Dodo-bones in a small cavern in the south-west part of the island.

An extract was read from a letter addressed to the Secretary by Dr. F. H. Bauer, of Buitenzorg, Java, containing some notes on the Flying Lizard, *Ptychozoon homalocephalum*, of that island.

Professor Bell exhibited and made remarks on a fine specimen of the Decapod Crustacean, *Alpheus megacheles*, obtained by Mr. Spencer at Herm, Channel Islands.

Mr. Martin Jacoby communicated the second portion of his paper on the Phytophagous Coleoptera of Japan obtained by Mr. George Lewis during his second journey, 1880-81. This part treats of the *Halticina* and *Galerucina* of Mr. Lewis's collection.

Mr. A. G. Butler read a paper containing an account of two collections of Lepidoptera recently received from Somali-land. He considered that the lepidopterous fauna of Somali-land was essentially Arabian in character.

Mr. L. R. Lydekker described a last upper molar of a Mastodon, which had been obtained by Mr. A. H. Everett, of Borneo, and referred it to a small race of *M. latidens*, previously known only from the Pliocene Siwaliks of India and Burma. The specimen was of much interest, as increasing our knowledge of the eastern range of the Siwalik mammals.

Mr. W. T. Blanford read a monograph of the genus *Paradoxurus*. After a critical examination of a large series of specimens, Mr. Blanford came to the conclusion that it would be necessary to reduce the numerous so-called species of this genus to about ten well-marked forms.

Mr. W. T. Blanford, on behalf of Mr. J. A. Murray, read a paper containing the description of a new species of *Mus* from Sind, proposed to be called *Mus gleadowi*.

Mr. F. E. Beddard read an account of the specific characters and structure of some New Zealand Earthworms of the genus *Acanthodrilus*.

November 17, 1885.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of October, 1885, and called attention to a collection of North-American Reptiles, presented by Mr. F. J. Thompson, amongst which were examples of the Alleghany Snake, *Coluber alleghaniensis*, new to the Society's Collection; and to an example of the Black-eyebrowed Albatross, *Diomedea melanophrys*, obtained in False Bay, Cape Colony, and presented to the Society by Mr. W. Ayshford Sanford.

The Secretary also exhibited to the meeting two curious Millipedes, believed to be *Spirostreptus annulipes*, which had been sent home from the Cape by Mr. Fisk for the Insect House.

An extract was read from a letter addressed to the Secretary by Major S. W. Yerbury, respecting the exact locality of a Chameleon, *Chamaleon calcarifer*, presented to the Society by that gentleman in June, 1885. Major Yerbury had obtained this specimen near Aden.

Mr. Sclater exhibited and made remarks upon two Newts, *Molge vittata*, transmitted to the Society by Dr. E. B. Dickson, of Constantinople, by whom they had been obtained from Brussa, Asia Minor.

Mr. H. E. Dresser exhibited and made remarks on a female specimen of the Kildeer Plover, *Ægialitis vocifera*, killed, in January, 1885, by Mr. Jenkinson on the Scilly Isles; and a young female Desert-Chat, *Saxicola deserti*, obtained near Spurn Head, Lincolnshire, in October, 1885.

Prof. F. Jeffrey Bell exhibited and gave an account of a specimen of a species of *Balanoglossus* obtained by Mr. Spencer at Herm, Channel Islands, being the first recorded instance of the occurrence of this Hemichordate in any part of the British Seas.

Mr. F. E. Beddard read the first of a proposed series of notes on the visceral anatomy of birds. The present paper treated of the so-called omentum of birds and its homologies. It was pointed out that this structure, present in many birds, but apparently absent, or only present in rudiment, in a few others, was represented by a structure having similar relations to the Crocodile, but in no other reptile.

Mr. Oldfield Thomas read a description of *Heterocephalus Phillipsi*, an extremely remarkable burrowing Rodent from Somali-land, belonging to a genus of which the only known species was based upon a single specimen obtained by Rüppell's collector in Schoa. Mr. Thomas considered the affinities of this Rodent to be with *Georychus* and *Bathyergus*.

Mr. Sclater read a paper containing a description of an apparently new species of Tanager of the genus *Calliste*, based on a specimen formerly in the Gould Collection, now in the British Museum. He proposed to dedicate this bird to its former owner as *Calliste Gouldi*.

Mr. Boulenger gave the description of a new Frog from Perak, Malacca, which he proposed to name *Megalophrys longipes*.—P. L. SCLATER, Sec.

NOTICES OF NEW BOOKS.

A Tour in Sutherlandshire; with extracts from the Field-books of a Sportsman and Naturalist. By CHARLES ST. JOHN. Second Edition. With an Appendix on the Fauna of Sutherland, by J. A. HARVIE BROWN and T. E. BUCKLEY. 2 vols. post 8vo. Edinburgh: D. Douglas. 1885.

THE works of Charles St. John will always have place amongst favourite authors on the book-shelves of naturalists and sports-

men. They contain a fund of information concerning the wild animals of the district in which he lived, imparted in such a delightful style that one is never tired of reading them. Although the author made no pretext of being a scientific zoologist, he was a naturalist in the true sense of the word, and, as every chapter in his book shows, a real sportsman. He derived more pleasure in studying the habits and instincts of the wild creatures he pursued than in endeavouring to make "the biggest bag on record," and it would be well if more sportsmen of the present day were to follow his example by observing more and slaying less.

Considering that the first edition of the 'Tour in Sutherland' was published in 1849, and has long been out of print, it is somewhat surprising that a second edition has not long ago been issued. It can hardly be said to be inferior to either of the other two works by the same author, and that it is the least popular of the three must be due to the fact that it is the least known. At length a new edition has appeared in two volumes, on smaller paper than the original, but tastefully printed and bound, like everything published by Mr. Douglas.

The old full-page illustrations are reproduced, although of little merit as compared with engravings of the present day; nor can we admire the introduction, as head- and tail-pieces of the pen-and-ink sketches, or scratches, by the author, many of which are no better than those which any schoolboy might draw upon his blotting-pad, and are, moreover, seldom correct. In our opinion they would have been better omitted; for they teach nothing, and detract from the favourable impression produced by a perusal of the text.

In a book so full of information on the haunts and habits of numerous species, the absence of an Index is a serious drawback, and impairs the utility of the work. It is true there was none to the first edition, but that, we should have supposed, was a defect to be remedied. A useful addition, however, has been made in the shape of an Appendix on the Fauna of Sutherland, contributed by Messrs. Harvie Brown and T. E. Buckley, than whom it would be difficult to find more competent authorities; for, besides having a personal acquaintance with the county, they possess the experience of practical field-naturalists. This Appendix, extending over eighty-six pages, contains, besides an introduction on the physical aspect of Sutherlandshire, lists of the Mammals,

Reptiles and Amphibians, Birds, and Fishes which have been met with in the county, including the Fishes of the Moray Firth.

The other portion of the work must be sufficiently familiar to our readers to render comments upon it unnecessary. We have no doubt there are many who will be glad to possess it in its present handy and portable form.

A List of Irish Birds: showing the Species contained in the Science and Art Museum, Dublin. By A. G. MORE, F.L.S., Curator of the Natural History Museum. 8vo, pp. 32. Dublin: Thom & Co. 1885.

ALTHOUGH intended chiefly as a catalogue of the species of birds preserved in the Science and Art Museum, Dublin, this timely publication is practically a key to the Irish avifauna. On looking carefully through it, two facts at once suggest themselves. The first is that several species reputed to have been met with in Ireland have been included in the list on too slender evidence; the second is that, owing to the more careful attention which of late years has been paid to Ornithology in Ireland, many other species not known to Thompson as Irish, have, since his day, been well ascertained to visit that country, and even to breed there. It would seem from Mr. More's "List," that he has not overlooked this, but has obviously endeavoured to sift the claims of all the rarer birds which have been hitherto included in the Irish catalogue, and to add fresh instances of the occurrence in Ireland of species which hitherto have been only noticed there in one or two instances.

We understand that this "List" is intended to pave the way for a new edition of Thompson's 'Natural History of Ireland,' which has been long needed, and we do not doubt that Mr. More will be glad to receive assistance from all those whose opportunities may enable them to be of use in collecting information.

Sixth Report on the Migration of Birds in the Spring and Autumn of 1884. By a Committee of the British Association. 8vo, pp. 186. London: West, Newman & Co. 1885.

THE Sixth Annual Report of this Committee forms a thick pamphlet of 186 pages, and comprises observations taken at

lighthouses and light-vessels, as well as at several land-stations, on the coasts of Great Britain and Ireland (except the South Coast of England), and the outlying islands; also from Heligoland, two stations in the Baltic, the Faroe Islands, and Iceland. Altogether 193 stations have been supplied with printed schedules for registering observations, and returns have been sent in from 118. We are at a loss to understand why the South Coast of England has been so neglected, there being no returns from any station between the Start L.H. and the Varne L.V.

The periods of migration occupied by different species vary greatly, from four weeks to as many months; no general rule can be laid down in this respect.

There was an immense and continuous rush on the coast from October 15th to 31st, migrants arriving continuously night and day. This rush was continued at some of the stations with but slight intermissions to the middle of November.

On the East Coast of Scotland, whilst desultory movements continued during September and October, the heaviest rushes are recorded in the middle of November. The last fortnight in October is the average annual period of what may be called the "great rush" of immigrants on the East Coast of England.

In previous Reports attention has been drawn to the fact of a migration in opposite directions going on at the same time over the North Sea. This is observed more particularly at south-eastern stations, on light-vessels moored at many miles distance from the nearest land, where, during the spring and autumn, the same species of birds, as Crows, Rooks, Jackdaws, Starlings, Larks, Sparrows, Buntings, and Finches, are recorded crossing the North Sea, moving from opposite quarters and passing both towards the British coast and towards the Continent. This apparently abnormal movement in opposite directions was again indicated in the autumn and spring of 1884-5.

With few exceptions, the majority of resident British birds leave these islands in the autumn, their place being taken by others, not always necessarily of the same species, coming from more northern latitudes, or from districts of Eastern Europe, where, on the approach of winter, the conditions of locality and food-supply are less favourable to existence. These immigrants, on the approach of spring, return to the Continent on the same lines, but in the reverse direction to those traversed in the

autumn; at the same time, also, our own birds return from the Continent to their nesting-quarters in these islands.

The notes under the head of separate species indicate several movements of special interest. Blackbirds crossed the North Sea in extraordinary numbers, commencing on September 12th and throughout October, and immense numbers in November; on the 11th, 12th, and 13th the rush appears to have been continuous, night and day, over the whole coast line; after this, intermittent to the end of the third week in January, 1885.

The Arctic Bluethroat occurred in some numbers between September 8th and 18th; eighty to one hundred were observed in one locality on the Norfolk coast on the 12th.

The migration of the Golderest was very pronounced. With one exception, the migration of this bird on the East and West Coasts of England commenced at the same date, August 28th, and also ended on the same date, November 16th.

On the night of October 4th, the time of the total eclipse of the moon, during the hours of greatest darkness, between 9 and 12 p.m., as observed by a member of the Committee (Mr. Harvie Brown), Golderests were striking the lantern of the Isle of May Lighthouse. On the Irish Coast the same night, at the South Maidens Lighthouse, twenty struck at 10 p.m., and at Rathlin Island Lighthouse the same number were taken at midnight.

There was a great arrival of Pied Flycatchers during the first week in May, 1885, at stations between Yarmouth and the Pentland Skerries. At Flamborough they arrived with a N.E. wind, accompanied by male Redstarts. Immense numbers of Ring Doves and Stock Doves crossed from the Continent between the 21st October and the end of November.

The main body of Woodcocks generally arrive in two flights, known to east-coast sportsmen as the "first flight," and after this the "great flight." In the autumn of 1884 the immigration of this species was most prolonged, commencing on September 1st, and continuing onward to January 20th, 1885, or 142 days. Four distinct rushes or flights are indicated: October 5th and 6th, another on the 10th to the 16th, a third, probably the "great flight," on the 28th; and again a very large flight between November 11th and 13th—a flight which also extended very far north, to the Pentland Skerries. The dates of the chief flights across Heligoland will be found to correlate very closely

with the arrivals on the East Coast. Very few Woodcocks are recorded from the West Coast of England. The notes, however, taken from October 8th to 14th, at the Nash East Lighthouse in the Bristol Channel, on this species are very interesting. The mean time of arrival may be fixed at 3.30 a.m. On the 8th a bird, after flying round the light, went off in a south-westerly direction. It is fair to presume that these Woodcocks formed part of the great flight which we know crossed Heligoland from the 12th to the 15th, and are also shown to have arrived on the East Coast between October 10th and 16th. Woodcocks migrate by night, and probably start on their journey in the dusk of evening. Supposing them to have left the coast of Denmark at 5 p.m., and travelling from north-east to south-west across Heligoland, so as to arrive at the Nash light at or about 3.30 a.m., the distance traversed would be 550 miles in $10\frac{1}{2}$ hours, or about 52 miles an hour, a rate of progress, from what we know of the flight of birds, probably nearly correct.

An unusual migration of Gulls to the Scotch coasts was remarked in 1884, in connection with swarms of sprats or "garvies" (*Clupea sprattus*), following and feeding on myriads of minute marine creatures. This aggregation has been attributed, and perhaps with reason (though it is a point on which the Committee has not sufficient information to decide), to the vast accumulation of ice west of Spitzbergen in the summer of 1884, and the consequent lowering of the temperature of the sea, which cause has impelled and driven southward the food-fishes along the course of the milder Gulf Stream to the uttermost limits of its possible extension, the firths and inlets of the East Coast of Scotland.

As a rule very few of our rarer immigrants are recorded from the East Coast of Scotland. The King Eider was seen off the Isle of May on September 24th, and the Black Redstart is recorded from the same station and Pentland Skerries. On the East Coast of England, besides the Bluethroats, already noticed, several rare and casual visitants have been recorded during the autumn: two examples of the Barred Warbler, one at Spurn Point and another on the Norfolk coast; the Icterine Warbler, also on the Norfolk coast; and an Ortolan, likewise from the same locality. The Lapland Bunting, in Lincolnshire and Norfolk; Tengmalm's Owl, in Holderness; and a Rose-coloured Starling, near Spurn.

On the West Coast of England the Report embraces notes on the White Wagtail, Pallas's Grey Shrike, Waxwing, Cassin's Snow Goose, Garganey Teal, Red-necked Phalarope, Ruff, Black Tern; whilst the scarcity or entire absence of the Tree Sparrow, Hooded Crow, and Brent Goose, and the presence of the Bernacle Goose, are of interest to one accustomed to east-coast observations. The capture, too, of eight Storm Petrels at the South Bishop, on October 14th, is a noteworthy incident. The lanterns vary not a little in their death-dealing attractions, those of the Bardsey, South Bishop, Smalls, Nash (E.), Godrevy, and Eddystone Lighthouses being most attractive, occasionally misleading two hundred victims in a single night.


In Ireland the great bulk of migrants arrive on the southern half of the East Coast, and on the easternmost of the southern counties—in other words, along the shore from Dublin to Waterford, between Rockabill and Dungarvan Lighthouses.

The usual course taken by birds seems to be either N.W. or S.E. The number of those which occur singly and do not migrate in flocks is large. In such cases it is difficult to trace the line of migration. As might be expected, the Snow Bunting is of more frequent occurrence on the western and northern coasts. A few remained as late as the first week in May, and it was again seen early in September, dates which have not hitherto been recorded in Ireland. Geese were also more numerous on the north and west coasts.

A remarkable migration of Rooks was observed at the Tearaght and Skelligs, both stations being several miles off the coast of Kerry. It lasted for three weeks, from November 2nd to 20th, the direction of flight being from west to east. The light-keepers were puzzled to know whence the birds could have come, the nearest land to the west being America, where this species is not found.


Mr. Gätke's Heligoland notes, from June 28th to the end of the year, comprise 118 species, including, as usual, several rare visitors to this ornithological observatory.

The Committee have this year made a useful addition to their Report in an outline map of the British Isles, showing the stations, marked in red.

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[VOL. IX., No. 97.] 

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